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Alcohol Health & Research World

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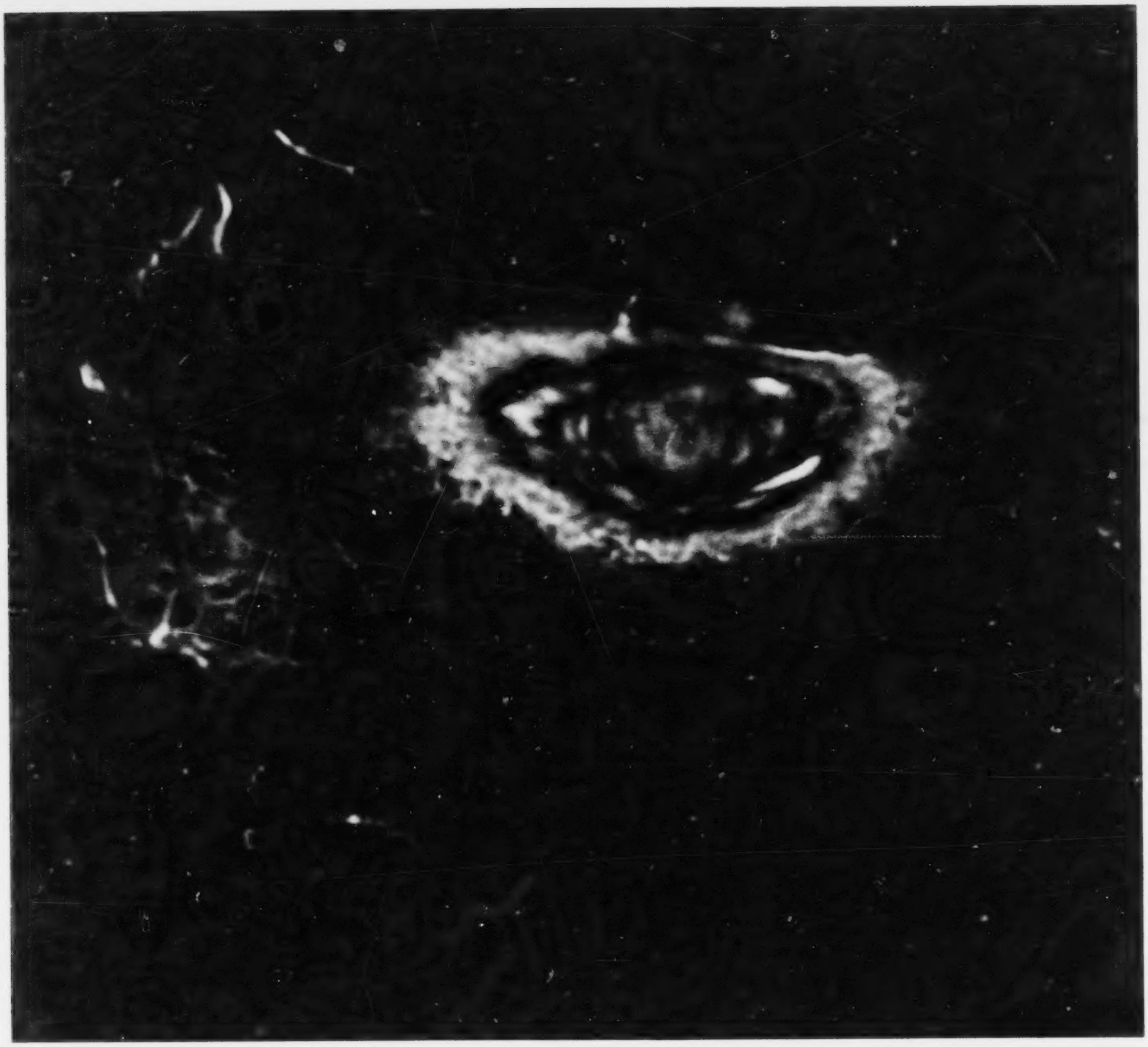
Winter 1985/86
Volume 10
Number 2

National Institute on
Alcohol Abuse and
Alcoholism



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From the Editor

We truly live up to our name in this issue of *Alcohol Health and Research World*, for we offer a wide array of articles that together explore a world of alcohol-related health and research issues.

We take you inside the NIAAA Intramural Laboratory of Preclinical Studies where investigators studying portions of single brain cells are helping to advance our understanding of the underlying mechanisms of alcohol dependence, tolerance, and withdrawal. Other articles discuss the role of alcohol in sexual dysfunction and in digestive diseases.

We explore the connection between alcohol and domestic violence and look at research on alcohol problems among the homeless and among military personnel.

We invite you to take an introspective look at spiritual issues surrounding alcohol use and abuse, and we interview several experts on the subject. Finally, we offer the third and final article in a series on statistics for research consumers.

While this issue's articles may, at first glance, seem unrelated, together they may help us better understand the far-reaching implications of alcohol use and abuse in society through a knowledge of current thoughts, ideas, and research findings in the field.

—Doug M. Podolsky

Alcohol
Health & Research World

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Alcohol Health and Research World is a quarterly produced by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) through the National Clearinghouse for Alcohol information, operated under contract number ADM 281-84-0005 by InterAmerica Research Associates. Terry Freeman is the Project Officer for the Clearinghouse. The Secretary of Health and Human Services has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through September 30, 1986. Opinions expressed in contributed articles do not necessarily reflect the views of NIAAA. The U.S. Government does not endorse or favor any specific commercial product or commodity. Trade or proprietary names appearing in this publication are used only because they are considered essential in the context of the studies reported herein. Manuscripts concerning research, treatment, or prevention of alcoholism and alcohol problems are solicited and should be sent to the Editor, *Alcohol Health and Research World*, P.O. Box 2345, Rockville, Maryland 20852. Subscriptions and changes of address should be sent to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscriptions are $12.00 a year or $15.00 if mailed to a foreign address. Single copies are available at $3.25 ($4.06 to a foreign address). These prices are subject to change without notice. Unless otherwise noted in the text, all material appearing in this magazine is in the public domain and may be reproduced or copied without permission. Citation of the source is appreciated.

About the Cover

A single liver cell is emblazoned with vivid hues in a method that employs light instead of chemical stains to facilitate microscopic examination. Researchers use this technique to help identify the physiologic and pathologic effects of alcohol on single cells and tissues of the liver and other organs of the body. Such innovative methods along with improved instruments aid in the study of alcohol's effects on the body. Among the many consequences of chronic alcohol abuse are alcohol dependence, liver disease, digestive diseases, and sexual dysfunction. Articles reporting on such adverse effects, as well as on other topics, appear in this issue. Photograph courtesy Cecil Fox, Senior Scientist, National Cancer Institute

Alcohol Health & Research World

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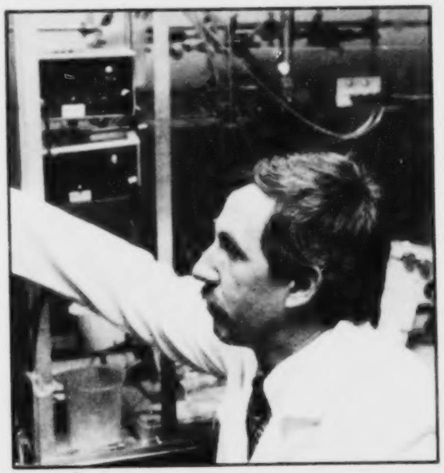

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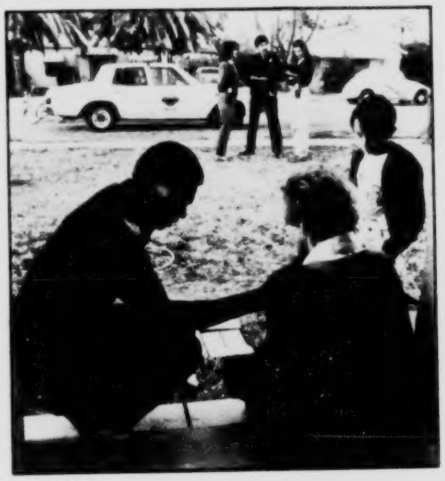

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The NIAAA Laboratory of Preclinical Studies

Photo by Christopher J. Dominski

Doug M. Podolsky

NIAAA intramural investigators at the Laboratory of Preclinical Studies (LPS) in Rockville, MD, are focusing their expertise and sophisticated technology on the study of single cells—and even on specific molecules—in a scientific quest to understand the underlying mechanisms of alcohol dependence, tolerance, and withdrawal.

"At this laboratory, we are on the cutting edge of science," says Forrest F. Weight, M.D., the chief of the LPS. "The idea behind preclinical research is to try to understand the physiological and molecular basis of alcohol's actions so that this information can be used in efforts to either prevent or treat those pathophysiological effects in alcoholics and those who suffer from alcohol problems."

Dr. Weight oversees research by a dozen NIAAA investigators engaged in preclinical studies (basic research that precedes development of clinical application of laboratory findings) that could answer such fundamental questions as these: What are the mechanisms by which alcohol produces intoxication? What are the processes involved in the development of alcohol dependence? What changes occur in tissues that lead to alcohol tolerance? What happens during withdrawal?

"The alcohol field is now in a phase of maturation," Dr. Weight adds. "Our investigators are trying to provide the fundamental information that can be used in understanding the pathophysiologic basis of alcohol's actions."

The LPS opened in 1978 and today its investigators are conducting interdisciplinary studies in seven major areas of alcohol research using animal models. "Basically, we're studying the effects of acute alcohol consumption; the impact of dependence and withdrawal upon physiology, pharmacology, and anatomy of the nervous system; and the systemic effects of alcohol," Dr. Weight explains.

LPS investigators are attempting to build the knowledge base that is vital to investigators involved in clinical studies. In fact, what is often touted in the lay press as "breakthroughs" for clinical treatment of disorders are usually the result of 20 or 30 years of solid preclinical studies such as those being conducted in Dr. Weight's lab.

He points out that most of the advances that have been made in medicine have been based on preclinical experimental research. By using animal models, one can investigate the biochemistry and physiology of cells and tissues in greater detail than one can with human subjects.

That's the key to understanding what investigators are attempting to do at the Laboratory of Preclinical Studies, Dr. Weight explains. "Our rationale is that by investigating and understanding the mechanisms involved in the alterations of a variety of biological processes that occur during acute and chronic alcohol administration, we should be better able to treat, and perhaps to prevent, many of the problems associated with alcohol abuse and alcoholism."

For instance, LPS researchers are investigating brain damage linked with alcohol abuse. The results of this ongoing investigation could ultimately have widespread clinical implications, with the possibility of pharmacological intervention.

More than 60 percent of chronic alcoholics exhibit some signs of alcohol-induced brain damage. Yet, very little is known about how alcohol produces these pathological effects in the brain. Upon post mortem examination of alcoholics who suffer from this condition, it has been found that there is a loss of brain tissue (atrophy) and nerve cells (neurons) in certain regions of the brain. In effect, certain portions of the brain appear to deteriorate as a result of chronic alcohol abuse.

"The mechanisms by which alcohol produces that kind of degeneration in the brain are really not understood," Dr. Weight says. "It is known that a deficiency of vitamin B_1 (thiamine) that occurs in some alcoholics can result in brain damage (Wernicke-Korsakoff syndrome). It has also been shown that in experimental animals on a nutritionally sound and vitamin-supplemented diet, the administration of alcohol for many months results in an atrophy of brain tissue and a reduction in the number of neurons in certain brain regions. This suggests that alcohol may have a toxic action that can cause a degeneration of the neurons.

Systematic studies on the mechanisms by which brain cells become damaged by chronic alcohol administration provide a scientific basis for diagnostic and preventive measures. They also provide models in which to test experimental therapies. "For instance, if we can determine the molecular basis of alcohol-induced nerve cell degeneration, we can attempt to develop drugs that will prevent these degenerative changes from occurring."

"As a result of these studies we hope to better understand the mechanisms of alcohol-induced neuronal degeneration and to identify in these experimental animals feasible means of pharmacological intervention with the hope of being able to

Forrest F. Weight, M.D., at the NIAAA Laboratory of Preclinical Studies in Rockville, Maryland.

prevent this kind of brain damage from occurring in humans," Dr. Weight says.

Investigating Localized Effects of Alcohol in the Brain

Although the psychoactive effects of alcohol on behavior are well known, whether these effects are due to localized effects in various regions of the brain is unclear. "We know that alcohol effects on brain function can result in intoxication and dependence. Moreover, the sudden cessation of alcohol intake in dependent individuals can produce a hyperexcitability of the nervous system called the acute withdrawal syndrome," Dr. Weight says. "In the extreme, the withdrawing individual may experience hallucinations or even convulsions. We do not know, however, whether such effects occur throughout the entire brain or whether there are localized changes in particular regions of the brain." To study the question of whether alcohol has localized effects in the brain, scientists in LPS have used a brain imaging method called the 2-deoxyglucose (2-DG) technique, developed by investigators at the National Institute of Mental Health (NIMH), that permits assessment of the entire brain.

This technique is based on the knowledge that the brain utilizes glucose as its only source of energy. Thus, uptake of glucose by the neuron is correlated with the neuron's energy needs. The NIMH investigators decided that one way to measure the metabolic activity of the brain was to utilize a chemical compound that mimics glucose so closely that it "fools" the neuron, which will take up the compound as it would glucose. The chemical compound, however, must be such that it cannot be metabolized further by the neuron, so that it remains trapped within the confines of the cell. The chemical that fits the bill is 2-deoxyglucose. By radioactively labeling this compound, the accumulation of 2-DG in the brain can be measured and indicates the amount of energy the cells are utilizing at a particular point in time. The greater the accumulation of this chemical in a group of cells, the greater the utilization of glucose in these cells. Thus, the accumulation of 2-DG provides an indication of the areas of neural activity in the brain.

Using 2-DG, scientists can look for regional differences in brain function. They can also try to identify areas where ethanol alters neuronal function. The results of this research are expected to provide a better understanding of how ethanol acts to increase or decrease activity in specific areas of the brain.

Using this technique, scientists inject animals with trace amounts of 2-DG. The amount of radioactive accumulated label is then used to estimate brain activity, with increased amounts indicating increased activity. Autoradiographs are then produced by exposing x-ray-sensitive films to the radiation emitted by the radioactive material in brain tissue removed from the animals. Autoradiographs of tissue from different areas of the brain are then analyzed by a computer that color codes the activity levels and produces an image. Analysis of the computerized image is used by scientists to determine where differences in brain activity occur.

In humans, it is known that the ethanol withdrawal syndrome is characterized by signs of CNS overactivity, as manifest in agitation, tremulousness, and hyperreflexia, and in the extreme, seizures and delirium tremens. It is also known that animals experiencing withdrawal exhibit a number of behavioral signs that mimic closely what is seen in humans. It has been shown that a 25-percent increase in cerebral oxygen consumption accompanies ethanol withdrawal in experimental animals. This finding led researchers to believe that the brains of these animals have increased neuronal activity and that during withdrawal, therefore, they are utilizing greater amounts of glucose.

"By using the 2-deoxyglucose technique that analyzes glucose utilization and the effects of alcohol on specific regions of the brain, we can determine the localization of alcohol's effects in the brain," Dr. Weight explains. "For example, using this technique in studies on withdrawal, we have found that there is a generalized increase in glucose utilization in the brain." This finding is consistent with the observation of hyperexcitability in patients undergoing withdrawal. "In addition, we have observed that there are localized areas of the brain that show greatly increased amounts of glucose utilization, indicating a great increase in the activity of that brain region," Dr. Weight says. "This information allows us to go to those specific areas that have shown the greatest activity and study their physiology and biochemistry to identify the changes that are occurring."

In analyzing the autoradiographs from animals undergoing alcohol withdrawal, researchers at the Laboratory of Preclinical Studies have found "columns" of increased activity 400 microns wide in the frontal sensory-motor cortex. Increased activity has also been detected in the vermis region of the cerebellum. "These regions of the brain are involved in the processing of sensory information and in sending signals to areas involved in motor control," Dr. Weight explains. "In fact, the increase in deoxyglucose uptake in the columns in the frontal sensory-motor cortex are 150 percent above controls; and in the vermis they are 130 percent greater than controls."

The LPS investigators also are studying the localized changes in metabolic activity in the brains of animals exposed to other drugs capable of producing dependence. Based on their investigations, they see both similarities and differences in withdrawal from ethanol, phenobarbital, and diazepam (Valium). These similarities and differences may provide a basis for investigating the pathophysiology of the withdrawal mechanism. "Such studies may lead to new understandings and treatment of withdrawal," Dr. Weight says.

Cellular Mechanisms of Alcohol Dependence, Tolerance, and Withdrawal

It also has been shown that the psychological and behavioral effects of ethanol—and the development of tolerance to ethanol—are based on actions of the drug on the nervous system. Although it is well known that the acute and chronic administration of ethanol can affect nervous system excitability, the cellular basis of such action is poorly understood. Because of this gap in the knowledge base, LPS researchers are attempting to characterize the cellular mechanisms that regulate nerve cell excitability and determine how ethanol affects those mechanisms. Besides being of interest to alcohol researchers, such studies promise to increase basic scientific understanding of the nervous system.

"We have found that one thing that alcohol does in the nervous system is to release calcium ions from both nerve cells and nerve terminals," Dr. Weight explains. "Furthermore, it has been found that calcium release from a nerve cell will decrease the excitability in that cell." This occurs because intracellular calcium release activates an electrochemical change that inhibits the triggering of the nerve impulses. These observations are important in terms of understanding the actions of alcohol on brain function because the central nervous system operates by means of electrical impulses in neurons and their processes.

"We are using electrophysiological methods to study these processes," Dr. Weight says. "Using these techniques, we can even record the changes in membrane voltage and the ionic currents that underlie those voltage changes in single nerve cells. We have found that in lower concentrations, alcohol increases the excitability of pyramidol neurons in the hippocampus region of the brain. This is an area thought to be involved in learning and memory. However, in the higher concentrations, alcohol decreases the excitability of these neurons. We are now looking at the mechanisms involved in these changes of nerve cell excitability."

LPS investigators are using the voltage-clamp technique to characterize the membrane ion currents that are involved in regulating nerve cell excitability. They are also utilizing a new technique called the patch-clamp method that gives researchers the capability of recording the current that flows through single ion channels in the cell membrane.

Such studies characterize the various ion channels that regulate excitability in a neuron. It is important to characterize which ion channels are affected by alcohol and how they are affected. "If alcohol affects the excitability of the membrane, it should affect these ion channels," Dr. Weight explains. "Only recently have the methods been developed that permit us to conduct these experiments in the mammalian neurons. Once we have characterized the acute effects of alcohol on these ion channels, we will attempt to determine the alterations of ion channel function associated with tolerance and withdrawal."

Molecular Studies of Alcohol Tolerance and Dependence

Results of such physiological studies, combined with biochemical studies, could help explain the underlying molecular basis for tolerance and dependence. For instance, it is believed that certain proteins involved in opening or closing a membrane ion channel must be phosphorylated for that action to take place. Protein phosphorylation is a process by which a phosphate group becomes attached to a protein, thus enabling the protein to perform certain functions. In addition, the phosphorylation of proteins is a final common pathway of paramount importance in animal cells. Research on the phosphorylation of proteins being conducted at LPS may yield important clues to understanding alcohol dependence and tolerance. In these studies, Dr. Harish Pant, a biochemist at LPS, has elucidated a number of molecular interactions involving protein phosphorylation. Dr. Pant and colleagues are studying the effects of acute and chronic ethanol administration and withdrawal on the phosphorylation of proteins in different regions of the brain. The objective of the research is to characterize any alterations in protein phosphorylation induced by alcohol.

The investigators have found that protein phosphorylation is affected by low

Photo by Christopher J. Dominiski

Forrest F. Weight and a laboratory researcher look for regional differences in brain function using imaging methods that permit assessment of the effect of alcohol and other drugs on the brain.

concentrations of ethanol as well as by calcium ions. These two may be related, because they have found that alcohol alters both membrane-bound and ionized calcium in cells. The demonstration that ethanol treatment affects protein phosphorylation provides an experimental basis for investigating whether alterations in the phosphorylation of proteins are involved in the molecular basis of the acute and chronic effects of alcohol in the nervous system.

Alcohol and the Immune System

LPS researchers not only are studying the cellular and molecular basis of alcohol's effects in the brain, but also are seeking to determine how alcohol affects the body as a whole—its systemic effects—including its impact upon the immune system. "It is known that alcoholics have a higher incidence of infectious diseases than nonalcoholics," Dr. Weight explains. "Although factors such as poor nutrition may contribute to this phenomenon, we are now involved in an investigation to determine whether alcohol treatment can affect the immune system and whether there are any biological factors that may contribute to the higher incidence of infection among chronic alcoholics."

The investigation into the effects of alcohol on the immune system is a collaborative effort among researchers from the Laboratory of Preclinical Studies, the NIAAA Intramural Laboratory of Clinical Studies on the NIH campus in Bethesda, MD, and Walter Reed Army Medical Center.

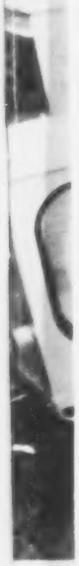
This research already has resulted in a major finding that the number of lymphocytes in spleen, thymus, and peripheral blood lymphocytes (cells that play an important role in the synthesis of antibodies) decreases significantly when laboratory animals are maintained intoxicated for four days.

Following cessation of the experimental alcohol administration, the lymphocyte count gradually rises and approaches control levels seven days later. Another significant observation of this study has been that the function of the remaining lymphocytes is impaired, Dr. Weight explains. "We have found that in animals treated with ethanol, the lymphocytes divide very poorly, if at all, and they don't have their proper immune types of response. We are investigating this in detail because lymphocytes are an extremely important part of the immune system." Because lymphocytes are involved in protecting the body from infectious diseases, these observations have important implications for understanding the increased risk for infection that alcoholics face.

"We're trying to identify the mechanism of alcohol's effect on the immune system with the hope of being able perhaps to prevent these alterations in lymphocyte function from occurring," Dr. Weight says. "We do not have all the answers yet, but we believe that the knowledge gained through this type of research will lead to the development of new methods for treating—and perhaps even preventing—a number of the medical problems associated with alcohol abuse and alcoholism." □

For further information, contact Forrest F. Weight, M.D., 12501 Washington Avenue, Rm 55-C, Rockville, MD 20852.

Doug M. Podolsky, *a member of NCALI's materials development staff, is managing editor of* Alcohol Health and Research World.



Courtesy National Institutes of Health

Alcohol Abuse and Digestive Diseases

Esteban Mezey, M.D.

Alcohol, one of the most commonly ingested drugs, has numerous detrimental effects on the digestive system. These effects are caused directly by alcohol or indirectly by a combination of other factors. Especially in alcoholics, an important factor is poor nutrition, which can be based on poor eating habits or on the alcoholic body's inability to process and use normally the foods that are ingested. Other complications are associated with other drugs taken along with alcohol, a wide range of individual susceptibilities, and nonalcoholic constituents of certain alcoholic drinks.

How is Alcohol Absorbed and Eliminated?

Alcohol is absorbed rapidly by the gastrointestinal tract. This process begins in the stomach and continues in the upper small intestine. Alcohol can be detected in the blood as early as 5 minutes after ingestion, and the peak blood concentration is reached in 30 to 90 minutes. For a stomach in the fasting state, the absorption rate is fast and the peak concentration is high. Alcohol is absorbed more slowly when ingested with or immediately after a meal. After absorption, alcohol is distributed equally throughout the body water and appears in the urine, the expired air, the spinal fluid, and the remainder of the intestine.

The elimination of alcohol from the body is accomplished mainly by metabolism in the liver. Less than 10 percent of an ingested dose is eliminated through the kidneys, the lungs, and the skin. The rates of elimination vary considerably among normal individuals, who eliminate between 60 and 150 mg of alcohol per kg (2.2 lb) of body weight per hour. The higher elimination rate of 150 mg/kg of body weight per hour is equivalent to 10.5 gm of alcohol per 70-kg man, which is approximately the alcohol content of 1 oz of 86-proof whiskey (10 gm), one 12-oz bottle of beer (12.6 gm), or 4 oz of table wine (9.3 gm). If, therefore, a 70-kg individual drank this amount every hour and if absorption were prompt, the blood alcohol theoretically should be zero at the end of each hour. This, of course, is not what actually happens, because absorption takes place over a period of 1 to 2 hours. Hence, blood alcohol levels will not be expected to fall to zero for about 2 to 3 hours after ingestion of the drinks mentioned. The maximum blood levels reached after the ingestion of 1 oz of 86-proof whiskey on an empty stomach will be approximately 20 mg per dl. This compares with the upper legal limit of 100 mg per dl (or blood alcohol level of 0.10 percent) for driving a motor vehicle in most States. The blood level reached is much lower when the same dose of alcohol is ingested with a meal because of the slower absorption in the presence of food, as mentioned previously.

Chronic ingestion of alcohol increases its rate of elimination because the metabolism of ethanol by the liver is enhanced. But the presence of a serious liver disease such as hepatic cirrhosis decreases the elimination rate.

Does Alcohol Irritate the Stomach?

Alcohol ingestion, even in moderate amounts, is a common cause of acute and chronic gastritis. Acute gastritis consists of superficial erosions and inflammation of the lining of the stomach. It is associated with acute symptoms of abdominal discomfort and indigestion. In cases of chronic gastritis related to alcohol abuse, gastric acid secretion is insufficient and anemia develops as a result of vitamin B_{12} deficiency. This deficiency follows a number of years of alcohol abuse because the alcohol-insulated stomach no longer secretes a particular glycoprotein that must bind to vitamin B_{12} in order to allow it to be absorbed via the intestine. In one study of randomly selected alcoholics admitted for detoxification, acute gastritis and chronic gastritis were found in 26 and 24 percent of the patients, respectively; this compares with values of 11 and 3 percent in nonalcoholic volunteers of the same age.

What Causes Gastritis?

Ingestion of alcohol in concentrations greater than 25 percent (50 proof) damages the mucosal lining of the stomach. When this happens, acid secreted by the gastric glands reenters the stomach lining. As a result, the lining swells, cells and small blood vessels are damaged, and erosions develop, with bleeding. It is thought that the release of histamine contributes to these damaging effects.

The combined ingestion of aspirin and alcohol is a very frequent cause of acute gastritis and bleeding. Alcohol and aspirin work together in breaking the lining of the stomach. Various studies have shown that blood loss produced by aspirin, as detected by inspecting the stool, is enhanced by intake of alcoholic beverages with the aspirin. The mechanism for the develop-

A patient undergoes upper gastrointestinal examination. This can include x rays and endoscopic examination. The latter test aids in the diagnosis of gastritis, inflammation of the stomach that can result from chronic alcohol use.

ment of chronic gastritis in alcoholics is unknown. Alcoholics with this disorder are at risk to develop gastric erosions and bleeding when they ingest alcohol. The symptoms and bleeding from acute gastritis usually subside soon after the ingestion of alcohol is discontinued. Sobriety results in recovery of the lining of the stomach in 2 to 5 days in cases of gastritis. By contrast, recovery of the stomach lining to normal in chronic gastritis may take 6 to 9 months and does not occur in all patients.

How is Gastritis Diagnosed and Managed?

The diagnosis of gastritis is confirmed by upper gastrointestinal endoscopy and by biopsy of the lining of the stomach. Preceding this diagnosis, bleeding from the stomach and the esophagus of the alcoholic can present in any of the following ways: (1) vomiting of blood which is either bright red and easily recognizable or of a brownish-color (discolored by alteration of the blood by gastric acid); (2) the passage of stools blackened by digestive enzymes acting on the blood or, more rarely, of bright red blood if the bleeding is very brisk; (3) generalized weakness and fatigue caused by anemia resulting from chronic blood loss, which can be detected by testing the stool for blood; or (4) detection of blood in the stool by testing during routine physical examination by the physician.

What are the Causes of Gastrointestinal Bleeding in Alcoholism?

Acute gastritis accounts for 25 percent of upper gastrointestinal bleeding in alcoholics as compared with 5 percent in nonalcoholic populations. The Mallory-Weiss syndrome, which refers to bleeding caused by lacerations of the stomach lining near its junction with the esophagus, is another common cause of bleeding in alcoholics. It accounts for 5 to 14 percent of gastrointestinal bleeding episodes in hospital populations of whom 60 to 80 percent reported heavy alcohol intake prior to the episode. Symptoms of retching and vomiting often precede the vomiting of blood, which suggests that the lacerations of the stomach lining may be caused by a sharp increase in intragastric pressure. Abnormally swollen blood vessels of the esophagus and the stomach are a common cause of bleeding in alcoholic patients with cirrhosis. The overall risk of a first bleed from such vessels is 20 to 30 percent, while the risk of rebleeding increases to 70 percent. Peptic ulcer accounts for 25 to 50 percent of upper gastrointestinal bleeding in both alcoholic and nonalcoholic populations.

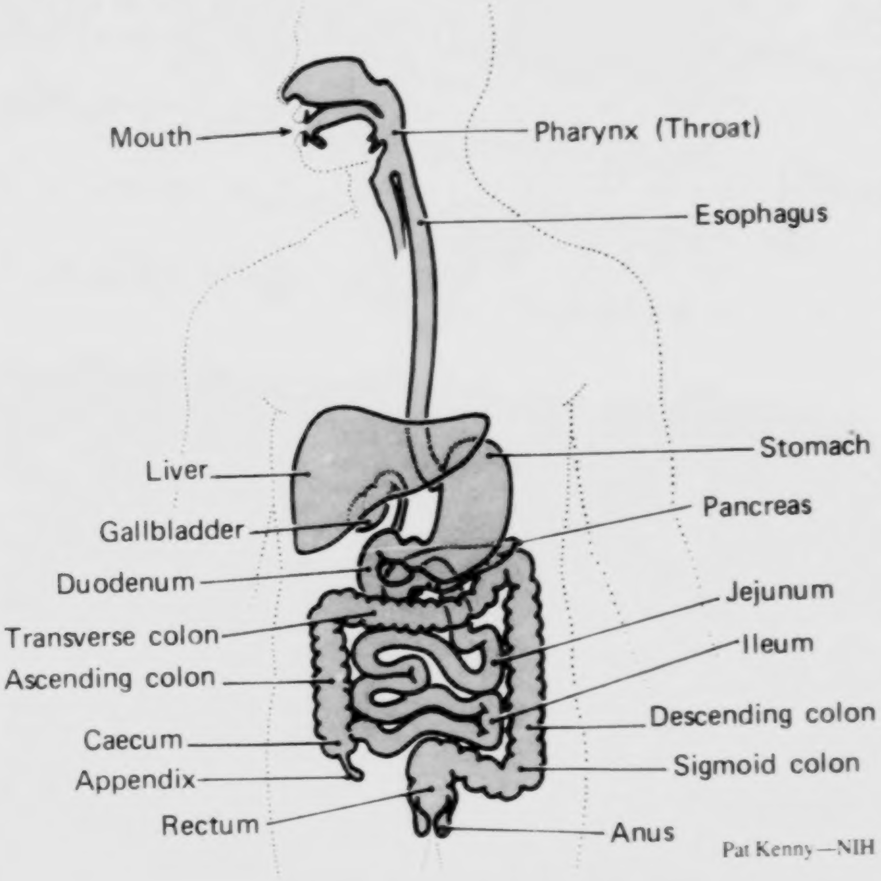
How Does Alcohol Affect the Physiology of Nutrition?

Chronic alcoholism is a frequent cause of malnutrition and vitamin deficiencies. While it is well recognized that alcoholism can lead to malnutrition based on poor dietary intake, disturbances in the absorption of nutrients may also contribute to malnutrition. Some substances that have been shown to be malabsorbed are the following: D-xylose (a carbohydrate used to test for absorptive function), thiamine (vitamin B_1), folic acid (a B-complex vitamin), vitamin B_{12}, and fat. In addition, decreases in the intestinal uptake of fluid, sodium, and chloride—possibly resulting from either decreased absorption or increased secretion—have been found.

The malabsorption that occurs during alcohol binges often is associated with symptoms of vague abdominal discomfort, diarrhea, and weight loss.

In black, but not in white, alcoholics there is often a marked intolerance to lac-

Figure 1 shows the entire digestive tract, including the mouth, pharynx, esophagus, stomach, small intestine (composed of three parts: duodenum, jejunum, and ileum), colon, and anus.



Pat Kenny—NIH

tose (present in milk products), which is manifest by crampy abdominal pain and diarrhea whenever milk or milk products are ingested. Lactase, the intestinal enzyme that converts lactose to the readily absorbed sugars, glucose and galactose, is decreased in these patients. The unconverted lactose travels to the lower intestine, where bacteria break it down into smaller molecules. These molecules, in turn, stimulate fluid secretion into the bowel, with resulting symptoms of abdominal pain and diarrhea.

The principal mechanism whereby alcohol causes malabsorption of nutrients is unknown. Most likely it is related to disruptive effects of alcohol on the membranes of intestinal cells and on alteration of enzymes necessary for the absorption of nutrients. Recent studies indicate that the inhibitory effect of alcohol on the absorption of thiamine may be related to inhibition of an enzyme responsible for biochemically active absorption of sodium. In many cases, the inhibitory effect of alcohol on absorption of nutrients is compounded by the development of malnutrition. The malnutrition, in turn, can decrease absorption. This vicious cycle is best exemplified by the findings that malabsorption develops more rapidly and is often more prominent in alcoholics who have a folic acid deficiency.

Malabsorption of nutrients and the symptoms of abdominal discomfort and diarrhea usually subside within 1 to 2 weeks of sobriety plus intake of a normal diet. The alcohol-induced intolerance to lactose in black patients is similarly reversible. Almost invariably there is weight gain as the patient improves. Infectious causes of diarrhea need to be ruled out by appropriate culture of the stool for bacteria and a search for parasites; however, no specific investigation for causes of malabsorption is indicated unless the symptoms persist beyond 2 weeks following abstinence. In patients who continue alcohol intake, it is likely that absorption of vitamins such as thiamine can be increased by administering supplemental amounts of these vitamins.

How Does Alcohol Affect the Pancreas?

The pancreas is a gland located behind the stomach and surrounded by the duodenum of the small intestine. It has two major functions: (1) exocrine: excretion into the duodenum of enzymes that digest starch, fat, and protein and (2) endocrine: secretion into the blood stream of hormones such as insulin and glucagon that regulate blood sugar. Alcoholism is a principal cause of pancreatitis (inflammation of the pancreas). The principal symptoms are abdominal pain that often radiates to the back, nausea, and vomiting. Elevated levels of amylase (the pancreatic enzyme that digests starch) are usually found in the blood. Severe pancreatitis in which there is massive destruction of the pancreas and disruption of the pancreatic vessels with hemorrhage into the gland occurs occasionally and is associated with a high mortality rate.

The first episode of abdominal pain caused by pancreatitis occurs at an average age of 37 years after a history of 5 to 10 years of heavy alcohol intake. The average daily ethanol alcohol intake that precedes the development of pancreatitis is about 150 gm (equivalent to 15 ounces of 86-proof whiskey per day).

The pancreatitis that characteristically develops in the alcoholic has been termed chronic relapsing pancreatitis because it has the following characteristics: (1) The initial episode of abdominal pain develops in a gland that already has irreversible changes in the ducts and gland structure, sometimes with scarring. This differs from the acute pancreatitis that occurs in association with gallstones, in which case the gland returns to normal appearance after the episode. (2) The acute attacks often recur after the ingestion of alcohol but sometimes also after the ingestion of a meal in the absence of alcohol. (3) With time, decreased function of the pancreas becomes manifested in steatorrhea (increased excretion of fat in the stool because of deficiencies of digestive enzymes) and in diabetes (because of insufficient insulin). The steatorrhea is characterized by large foul-smelling stools that tend to float in water. The continued malabsorption of fat and other foodstuffs

Associations have been found between chronic alcohol ingestion and cancers of the esophagus and the colon. Here, a physician examines results of upper gastrointestinal tests for evidence of tumors.

Courtesy National Institutes of Health

results in marked weight loss. The episodes of abdominal pain become more frequent and severe. The pain may become constant and unbearable, requiring the prescription of analgesic narcotics. As a consequence, many of these patients become addicted to narcotics.

How is Pancreatitis Managed?

The principal treatment of acute pancreatitis is constant removal of gastric acid, which normally stimulates the pancreas, by nasogastric suction, and the administration of analgesics. Fluids, electrolytes, and carbohydrates are administered intravenously. The symptoms of abdominal pain usually subside in 1 week, following which food intake is reinstituted. Steatorrhea is treated by oral replacement of pancreatic extracts containing lipase (the enzyme that digests fat) before each meal, while diabetes mellitus is treated with insulin. Pancreatic surgery is sometimes performed for patients with chronic pancreatitis who have constant, intractable pain. This approach has been successful in relieving pain in about 50 percent of these patients.

Is the Risk of Cancers of the Digestive System Increased by the Consumption of Alcohol?

Significant associations have been found between alcohol ingestion and cancers of the esophagus and the colon. Alcohol and smoking jointly contribute to increase the risk of the development of cancer of the esophagus. The consumption of beer is particularly strongly correlated with mortality rates of cancer of the colon and rectum. A possible association between alcohol ingestion and cancer of the pancreas has been suggested by some surveys but not by others. ☐

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Glossary

Digestion. Conversion of food into small absorbable forms.

Duodenum. Initial 12 inches of intestine starting with its origin in the stomach.

Endoscopy. Inspection of the lining of the gastrointestinal tract with a flexible soft tube. In the case of upper gastrointestinal endoscopy, the tube is passed by the mouth into the esophagus, stomach, and duodenum.

Histamine. A substance present in animal tissues which is held responsible for the dilatation and increased permeability of blood vessels leading to tissue swelling.

Nasogastric suction. Suction of stomach fluids by means of a flexible tube inserted through the nose and extending into the stomach.

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Alcohol and Sexual Dysfunction

Dorothy T. Moore, Ph.D.

Beverage alcohol is a double agent. Nowhere is this more evident than in the realm of sex. Shakespeare, in the widely quoted comment by a porter in "Macbeth," put the problem this way: "Lechery, sir, it (alcohol) provokes, and unprovokes; it provokes the desire, but it takes away the performance." (Act 3, Scene 2)

In modern advertising, as well as in numerous films, soap operas, and plays, a glamorous view of alcohol use is presented to the American public. This is the view primarily of the mainstream American male, who supplements charm, flowers, and other ingratiating maneuvers with the desire-provoking drink offered to a relatively unsuspecting female. In Ogden Nash's words, "Candy is dandy but liquor is quicker." ("Reflections on Ice-Breaking" 1945)

On the other hand, alcohol has been called a gonadal toxin (Van Thiel 1981) because of its directly damaging effects on testicular form and function. Indeed, at the extreme end of a continuum of consequences, the results of long-term abuse read like a grim litany. This is the down side of the story, as has been scientifically established in numerous clinical and laboratory studies over the past decade or so.

These and other NIAAA-supported investigations are making it possible to fill in the picture of sex-related alcohol effects, from temporary arousal to severe disability. For progress in alcohol-related research, the overwhelmingly beneficial result of these studies has been to bring together—under one roof, so to speak—investigators who take different approaches to similar and related problems. Indeed, sexual dysfunction is only one of many areas in which the interaction of scientists engaged in alcohol research has begun to provide solid answers to previously puzzling questions.

The purpose of this article is to highlight the findings of sex-related research with a view to identifying areas in which there is a need for more explanation about the effects of alcohol on human sexuality.

Most alcohol-related research has been male-oriented, partly because epidemiological studies have shown that male alcoholics far outnumber female alcoholics (USDHHS 1983*a*). The main emphasis has been on the ability to perform (i.e., on potency). Long-term alcohol abuse also can change the male's physical appearance toward that of a female, and considerable effort has been made to discover the mechanisms that underlie such changes.

The effects of alcohol on the adult human female have been of less apparent interest than how alcohol affects—and can harm—the infant she bears. In recent years, however, more effort is being made to understand the role of alcohol in the health and experience of the adult female herself. To this end, more progress is still needed.

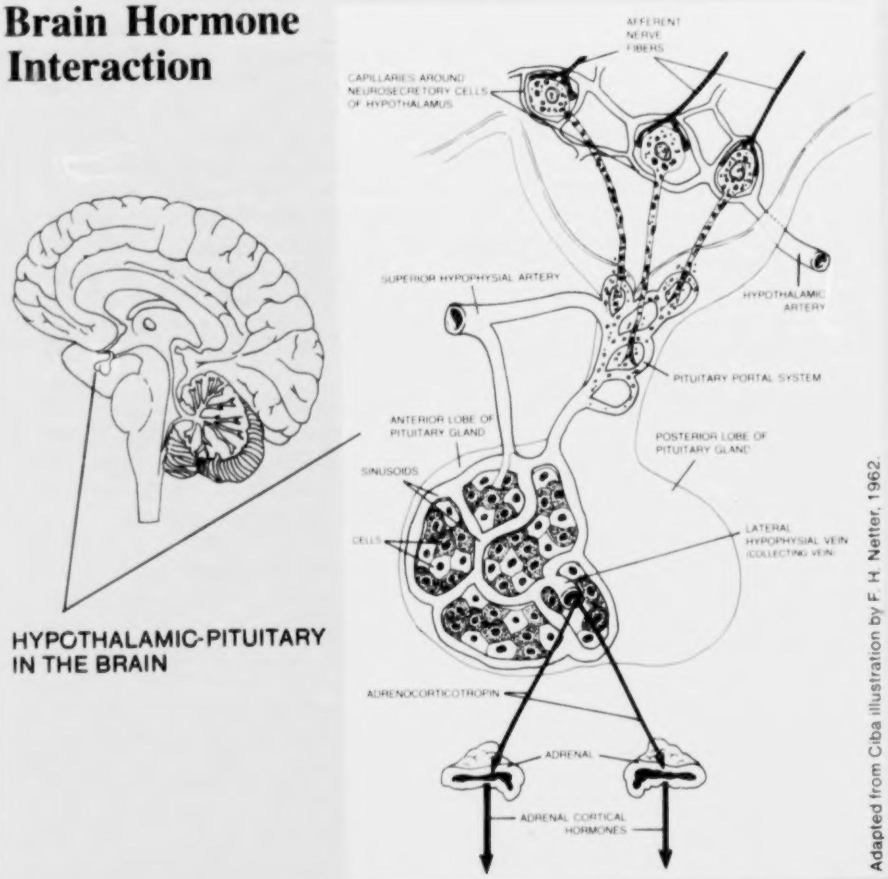
Male Reproduction

The best-documented clinical manifestation of long-term alcohol abuse in men is a decrease in reproductive competence (USDHHS 1983*b*). Two problems contribute to this disability: impotence (relative or complete) and a decrease in the number of normal spermatozoa. Van Thiel (1981) has estimated that 70 to 80 percent of chronic alcoholic men experience a decrease in sexual desire or potency or both. In the most severe cases, hypogonadism (reduction in the size of the testes) is present.

At one time, it was thought that the disabling effects of long-term alcohol abuse were indirect, being side effects of severe liver disease. As the results of clinical studies and increasingly sophisticated laboratory tests accumulated, however, it became clear that alcohol and its principal metabolite, acetaldehyde, directly damage testicular tissue. Histologic examination showed that the seminiferous tubules were diminished in diameter (Van Thiel 1981). Furthermore, the Leydig cells, which are necessary for secretion of testosterone, the principal male hormone, appear to suffer direct damage (Gavaler and Van Thiel 1982; Van Thiel 1984).

These direct effects of alcohol abuse are compounded by alcohol-induced liver dysfunction. Of special relevance for male sexual performance is the link between vitamin A and sperm production. (For a detailed review, see Bonjour 1981.) After vitamin A is ingested, either as it naturally occurs in animal tissue or as a vegetable carotenoid, it is actively absorbed in the gastrointestinal tract and then deposited in the liver, where it is transformed into retinol. As retinol, it is transported in the bloodstream to other organs. In the testes, vitamin A (as retinol) is essential for spermatogenesis. In the eye, it is necessary for maintaining the visual pigments of the retina. Alcoholics who are deficient in sperm production also frequently have visual problems, especially night blindness.

Brain Hormone Interaction


HYPOTHALAMIC-PITUITARY IN THE BRAIN
AFFERENT NERVE FIBERS
CAPILLARIES AROUND NEUROSECRETORY CELLS OF HYPOTHALAMUS
SUPERIOR HYPOPHYSIAL ARTERY
HYPOTHALAMIC ARTERY
PITUITARY PORTAL SYSTEM
ANTERIOR LOBE OF PITUITARY GLAND
POSTERIOR LOBE OF PITUITARY GLAND
SINUSOIDS
CELLS
LATERAL HYPOPHYSIAL VEIN (COLLECTING VEIN)
ADRENOCORTICOTROPIN
ADRENAL
ADRENAL CORTICAL HORMONES

Adapted from Ciba illustration by F. H. Netter, 1962.

Anatomical connections between brain function and reproductive functions are illustrated in this sidebar.

Nerve cells in the hypothalamus, acting as a hormonostat, interpret hormone levels in the bloodstream as deficient, sufficient, or excessive. The specialized cells then trigger appropriate action.

For example, if the circulating level of a steroid hormone secreted by the adrenal glands is too low, the hypothalamus sends a "releaser" chemical to the anterior portion of the pituitary, via connecting blood vessels. The pituitary gland responds by secreting adrenocorticotropin hormone (ACTH) into the bloodstream. The extra supply of ACTH is carried to the adrenal glands (located atop the kidneys). The result is secretion of steroid hormones by the adrenal cortex.

Alcohol-related disturbances in this *hypothalamic-pituitary-adrenal axis*, discussed frequently in the alcohol literature, are known to cause sexual dysfunction in both men and women.

As the target organ of biochemical messengers from the brain and the pituitary, the adrenal cortex secretes steroid hormones, all synthesized from cholesterol. These include androgens, estrogens, and progesterone.

A similar process occurs in the *hypothalamic-pituitary-gonadal axis*, where the gonads themselves serve as target organs. For example, if testosterone is circulating at too low a level, the hypothalamus signals the pituitary gland to secrete gonadotropic hormone (GTH). The resulting increase in circulating GTH stimulates the testes to synthesize and secrete more testosterone.

In the female, GTH stimulates the ovaries to produce several sex hormones, including follicle-stimulating hormone (FSH), luteinizing hormone (LH), and prolactin. In turn, the follicles produce estrogens and the corpus luteum produces progesterone.

The posterior lobe of the pituitary, not pictured here, secretes into the bloodstream two hormones that are synthesized in the hypothalamus itself. These are proteins, not steriods. One is vasopressin, which is an antidiuretic. When alcohol inhibits hypothalamic activity, the result is excessive urination. (Thus a "refreshing" drink actually leads to dehydration.) The other protein hormone, oxytocin, aids both uterine contractions and the release of milk. When alcohol consumption inhibits hypothalamic activity, the flow of milk from the mammary glands is suppressed.

—Dorothy T. Moore, Ph.D.

Because zinc interacts with vitamin A in the liver to mobilize retinol and also participates in the metabolism of visual pigments, some impotent alcoholics with impaired night vision have been treated with vitamin A or zinc or both. The results vary considerably, from no effect to complete recovery. The reasons for this variation are not known. Given the complexity of the systems involved, several factors could be responsible. Where dietary supplements are concerned, it is well to bear in mind that absorption and utilization of nutrients present in the diet are usually impaired in the gastrointestinal tract of the alcoholic.

Another aspect of male reproduction—effects of paternal drinking on the development of the fetus—is virtually unexplored. The information available at this stage is based primarily on studies of nonhuman animals. (For reviews, see Anderson 1982 and Joffe and Soyka 1982.) Considering the known abnormalities in the male alcoholic's sperm population, clinical investigation of this question seems warranted. Alexander (1982) provides guidelines for clinical evaluation of male infertility.

Female Reproduction

Much research has been done and volumes have been written about the consequence of maternal alcohol consumption during pregnancy. No attempt will be made here to go extensively into the subject of alcohol-related birth defects. Readers can find comprehensive and detailed coverage of this subject in the Fall 1985 issue of *AH&RW* as well as in other publications (e.g., Ciba Foundation 1984; Little and Ervin 1984).

As noted below (under "Hormone Changes"), ovarian dysfunction has been connected with alcohol abuse, though the precise mechanisms involved in this and related problems, such as dysmenorrhea and amenorrhea, are not well understood. As Gavaler and Van Thiel (1982) have commented, little is known about the toxic effects of alcohol in the female. Attempts are being made to fill this gap. In at least one such effort, women appear to be highly vulnerable to biomedical consequences of alcohol abuse (Hill 1984) and it is suggested that those concerned with women's reproductive health be alert to alcohol abuse as possibly related to a wide variety of obstetrical and gynecological problems (Wilsnack 1984).

Because women are especially vulnerable to feelings of shame, guilt, and self-blame when they have drinking problems (Mandel and North 1982), the responsibility of the examining physician is more complex than when males' problems are being explored. For alcohol problems of both sexes, however, Guzé (1985) advised his medical colleagues and medical educators to look for alcoholism clues when diagnosing illnesses of any kind.

Hormone Changes

In chronic alcoholism, the liver is a primary site where sex hormones and their chemical receptors undergo crucial changes. It is now clear that this is not the full explanation for the changes in physical appearance that are called feminizing in males (Van Thiel and Chiao 1983). In the most extreme cases, body hair is reduced, pubic hair takes on the female pattern of distribution, mammary glands enlarge, and muscle mass is reduced. Hypogonadism also is present.

Laboratory studies have delineated hormonal changes in the male liver, which normally contains about one-third of the estrogen receptors found in the female liver. In the male alcoholic who exhibits feminizing changes in appearance, the estrogen balance is similar to that of females. Eagon and coauthors (1983) suggest that alcohol increases estrogens in both liver and testes by reducing the male hormone level. Van Thiel (1984) includes pituitary, hypothalamus, liver, fat, and skin disorders as contributing to the associated hormone disturbances.

Several demonstrable differences separate male from female hormone responses to alcohol. For example, researchers consistently report a dramatic drop in circulating testosterone levels in the male in response to alcohol, either acute or chronic; but key sex hormone levels in females are not affected by an acute challenge (Mello et al. 1984; Valimaki et al. 1983). Cicero (1983*a*) sees the acute and chronic depression of testosterone levels in males as resulting from direct effects of alcohol on the pituitary gland and the testes as well as from degradation of male sex hormones in the liver.

The female's physiological response to alcohol is complicated by her ovulation cycle (Harvey 1984). In addition, the hormones of postmenopausal females do not react exactly like those of younger females (Mendelson et al. 1983). Another complication has been introduced by research showing that oral contraceptives are associated with a decrease in the rate of alcohol metabolism (Jones and Jones 1984) and significant increases in acetaldehyde levels (Jeavons and Zeiner 1984). Martins and Dada (1983) have pointed out a need for further clinical evaluation of the effects of oral contraceptives interacting with alcohol and other drugs.

These findings point to another problem in research: Besides being biologically different from males, the human female also is different from females of other species. One key aspect of this difference is that the human female's sexual behavior is not driven primarily by hormones; there is no such thing as an estrus cycle in humans. (Theoretically, the human female is always capable of being receptive sexually.) The sexual behavior of nonhuman females is, by comparison, highly constrained, locked into a set pattern by the periodic rise and fall of key hormones. Therefore, it is difficult to interpret animal studies as revealing what we need to know about human female behavior and alcohol effects.

For male alcoholics, the primary issue is the effect of alcohol on synthesis and distribution of androgens, the male sex hormones. For the female, the reverse question is of at least equal importance: How do the female hormones affect the metabolism of alcohol? It appears that estrogen in the liver inhibits the breakdown of alcohol metabolites (thus allowing acetaldehyde to accumulate). Zeiner (1983) has suggested that this estrogen effect may be related to the male-female difference in voluntary alcohol consumption. Even in studies of sex-related differences in nonhuman laboratory animals, the females lean less than the males toward heavy voluntary consumption of alcohol (Messiha and Tyner 1981). The simplest explanation would be that the high level of acetaldehyde associated with estrogen activity in the liver has an aversive effect. This does not seem a sufficient explanation, however, if the liver of the male alcoholic is abnormally estrogenic and the male drinks more than the female.

These findings are not to be taken as meaning that women are not at risk to become alcoholics. When they do drink heavily, they are biologically vulnerable in ways that are only recently being studied systematically. (For results of a household survey, see Wilsnack et al. 1984.)

In a study of alcohol-fed rats, Gavaler (1983) found that gonodal atrophy was high in both sexes and that the uterus was less resistant to toxic effects than were the seminal vesicles and the prostate. Sexual dysfunction of human females may reflect some such vulnerability, though the uterus is not a gland and produces no sex hormones. In any case, it is known that ovarian function is disrupted in the female alcoholic as is the menstrual cycle, and a decrease in fertility is to be expected (Wilsnack 1984; Ylikahri and Valimaki 1983). There is also some evidence that alcohol-induced liver damage takes a higher toll in the female than in the male and that it leads to severe sexual dysfunction (Hill 1984; Valimaki et al. 1984).

Social and Cultural Factors

In human society more than in the rest of the animal kingdom, conditions vary with wide differences between cultures and even within a given group. The relationship of sexual practices to alcohol is no exception. This means that biologically oriented studies will not suffice to describe and explain all we need to know in this area.

A case in point is the review by Leiblum and Rosen (1984) of studies on acute effects of alcohol on sexual response. In males, measures of physiological arousal suggested that alcohol at low dose levels "provokes the desire," as Shakespeare would say; but higher doses were correlated with depression of physiological responses. Yet the subjective reports of the subjects did not agree with the instrumentally measured differences at different dose levels.

Similarly, by use of a device that measures vaginal blood flow, investigators found a depression in female physiological responses when these same subjects reported feeling increased erotic arousal as a result of drinking alcohol.

Sutker and coworkers (1983) also found that men and women did not differ in perceived levels of intoxication, physical sensations, or mood states despite measurable sex differences in peak blood alcohol level.

Findings such as these have led some authors (e.g., Price and Price 1983) to discount the once-popular notion that alcohol affects arousal by removing inhibitions that normally limit behavior. Instead, more cognitive theories about expectations, social pressures, and issues of personal identity are currently in favor. (For a review, see Wilson 1981.) The same tendency is apparent in at least one discussion of a hypothesized connection between alcohol and aggressive male behavior (Cicero 1983*b*).

For women in particular, social issues loom large in the explanations for their patterns of alcohol use and abuse

Readings on Treatment

In the articles and books listed below, the authors discuss methods for treating alcohol-related sexual problems. This is a sampling of the available literature. For information on additional readings, contact the National Clearinghouse for Alcohol Information, P.O. Box 2345, Rockville, MD 20852.

ALEXANDER, N.J. Male evaluation and semen analysis. *Clinical Obstetrics and Gynecology* 25:463–482, 1982. Described here are clinical procedures for evaluating male fertility, with special emphasis on such alcohol-related consequences as impotence and atrophy of the testes.

BONJOUR, J.P. Vitamin and alcoholism. IX. Vitamin A. *International Journal for Vitamin and Nutrition Research* 51:166–177, 1981. Methods and results of treating vitamin A and zinc deficiency for visual disturbances as well as for sexual dysfunction in men are reviewed.

GAD-LUTHER, I., and LAUBE H. Types of interaction in alcoholism complicated marriages and their relationship with existing patterns of sexual difficulties. In: Schecter, A.J., ed. *Drug Dependence and Alcoholism: Biomedical Issues*, Vol. 1. New York: Plenum Press, 1961. pp. 719–728. Several standardized measuring instruments were used to investigate the stages of alcoholism in marriages and the range of sexual interaction.

GUNDERSON, I. Incest and alcoholism. *Catalyst* 1(3):22–25, 1980. Effective intervention and the responsibilities of the therapist in this unstable family situation are explored.

MANDEL, L.L., and NORTH, S. Sex roles, sexuality, and the recovering woman alcoholic: Program issues. *Journal of Psychoactive Drugs* 14:163–166, 1982. The training of personnel skilled in treatment processes for women is described, and a recommended treatment model is presented.

MARTINS, O.O., and DADA, O.A. Drug effects on the intestinal absorption of estrogens. *Journal of Steroid Biochemistry* 19:821–825, 1983. Alcohol and some medications are seen as altering the availability of estrogens. The authors suggest further clinical evaluation of the effects of oral contraceptives.

MORGAN, M.Y. Sex and alcohol. In Sherlock, S., ed. *Alcohol and Disease. British Medical Bulletin* 38(1):43–48, 1982. The author provides a table of clinical and hormonal features in male alcoholics with and without liver disease and in men with nonalcoholic cirrhosis.

NOTH, R.H., and WALTER, R.M., JR. Effects of alcohol on the endocrine system. *Medical Clinics of North America* 68:133–146, 1984. The clinical effects of alcohol abuse on the endocrine system are reviewed with reference to related complications and to therapeutic approaches.

NURSE, A.R. Role of alcoholism in relationship to intimacy. *Journal of Psychoactive Drugs* 14:159–162, 1982. It is proposed that a triangular relationship (with alcohol as the "third person") exists. Suggestions for a successful therapeutic process are provided.

POWELL, D.J., *ed. Alcoholism and Sexual Dysfunction*. New York: Haworth Press, 1984. 135 pp. The interaction of alcoholism treatment and sex therapy is emphasized. The volume concludes with an appendix of resources.

VAN THIEL, D.H. Ethanol: its adverse effects upon the hypothalamic-pituitary-gonadal axis. *Journal of Laboratory and Clinical Medicine* 101:21–33, 1983. With prolonged abstinence from alcohol, some alcoholics spontaneously recover normal sexual function. For others, long-term hormone therapy may help.

VAN THIEL, D.H.; GAVALER, J.S.; and SANGHVI, A. Recovery of sexual function in abstinent men. *Gastroenterology* 84:677–682, 1982. Sixty chronically alcoholic men who were impotent and were known to have abstained from alcohol for a minimum of 3 to 6 months were followed medically. Spontaneous recovery occurred in 25 percent. Results with the other 75 percent suggest some degree of androgen insensitivity.

VAN THIEL D.H.; GAVALER, J.S.; EAGON, P.K.; CHIAO, Y.-B.; and LESTER, R. Hypogonadism and feminization in alcoholic men: The past, present, and future. In: Galanter, M., ed. *Currents in Alcoholism: Recent Advances in Research and Treatment*, Vol. 8. New York: Grune & Stratton, 1981. pp. 29–40. Therapeutic approaches are evaluated in connection with their potential for aggravating alcohol-weakened livers, and the disappointing results of clomiphene therapy and androgen replacement are documented.

WILSNACK, S.C.; KLASSEN, A.D.; and WILSNACK, R.W. Drinking and reproductive dysfunction among women in a 1981 national survey. *Alcoholism: Clinical and Experimental Research* 8:451–458, 1984. The findings suggest that those concerned with women's reproductive health be alert to alcohol abuse as possibly related to a wide variety of obstetrical and gynecological problems.

(Covington and Kohen 1984; Mulvaney 1983; Wilsnack and Beckman 1984) and in recommendations for female-oriented therapy (Covington and Kohen 1984; Hill 1984; Mandel and North 1982; Vannicelli and Hamilton 1984).

Until more is known about the mechanisms by which alcohol use—acute or chronic—affects hormone levels, about possible genetic factors in individual and sex differences in alcohol responses, and about the actual prevalence of alcohol consumption among both men and women, analyses based on social and psychological theorizing must remain speculative.

Nevertheless so little is known with a comfortable degree of certainty that research is going forward on this front. For instance, an article in this issue (p. 46) on the self-handicapping model of alcohol abuse presents a new approach to psychological factors that may prove to be important.

Summary

Conflicting messages on the sex-related effects of alcohol use appear to be corroborated, but in different ways. Through ex-

Continued on page 51

Alcohol Problems and Homelessness

Findings from the Ohio Study

Illustration by Kurt Mulholland

Dee Roth, M.A.
Jerry Bean, Ph.D.

In 1984, the Office of Program Evaluation and Research of the Ohio Department of Mental Health completed a statewide study in which 979 homeless people were interviewed in a wide range of living conditions in both urban and rural settings.

The study, funded by the National Institute of Mental Health and presented at a special NIAAA-sponsored meeting on "The Homeless with Alcohol-Related Problems," was designed to describe the demographic characteristics of homeless people; their employment history, social support, and use of social services; their medical and other problems; and their history of psychiatric hospitalization as well as their current mental health status.

While alcohol problems were not the central focus of the study, homeless interviewees were asked how much they had been drinking during the past month and whether they had ever gone to anyone for help about their drinking.

Of the overall homeless sample, 45 percent said they had been drinking "some" and 19 percent said they had been drinking "a lot" during the past month. Nearly 27 percent indicated that they had at some point in their lives gone to someone for help about their drinking.

Because the research procedures did not include a classification of subjects as "alcoholic," it was decided that the group with alcohol problems be defined as those individuals who said they had been drinking some or a lot in the past month *and* had indicated that they had ever gone to anyone for help about their drinking. According to this classification scheme, 204 respondents (20.8 percent of the total

Table 1: Selected demographic characteristics of alcohol-problem respondents (n = 204) and other interviewees (n = 775) in the Ohio homelessness study. (Source: Alcohol Problems and Homelessness: Findings from the Ohio Study)

	Alcohol		Others		Total	
Characteristic	**Number**	**%**	**Number**	**%**	**Number**	**%**
Sex						
Male	191	93.7	602	77.7	793	81.0
Female	13	6.3	173	22.3	186	19.0
Total	204	100.0	775	100.0	979	100.0
Age						
18–29 years	44	21.6	308	39.7	340	34.7
30–39 years	51	25.0	219	28.3	270	27.6
40–49 years	46	22.5	118	15.2	164	16.8
50–59 years	42	20.6	88	11.4	130	13.3
60 years and over	18	8.8	33	4.3	63	6.4
No Answer	3	1.5	9	1.2	12	1.2
Total	204	100.0	775	100.1	979	100.0
Marital Status						
Married	7	3.4	81	10.5	88	9.0
Separated	23	11.3	112	14.4	135	13.8
Widowed	11	5.4	32	4.1	43	4.4
Divorced	92	45.1	155	20.0	247	25.2
Never been married	70	34.3	368	47.5	438	44.7
Living together	1	0.5	20	2.6	21	2.1
No answer	0	0.0	7	0.9	7	0.7
Total	204	100.0	775	100.0	979	99.9
Veteran Status						
Yes	92	45.1	218	28.1	310	31.7
(Vietnam Veteran)	(21)	(10.3)	(62)	(8.0)	(83)	8.5)
No	112	54.9	553	71.4	665	67.9
No answer	0	0.0	4	0.5	4	0.4
Total	204	100.0	775	100.0	979	100.0
Ever Been In Jail/Prison						
Yes	177	86.8	396	51.1	573	58.5
No	27	13.2	371	47.9	398	40.7
No answer	0	0.0	8	1.0	8	0.8
Total	204	100.0	775	100.0	979	100.0

group surveyed) were identified as having alcohol problems. In the summary statistics, these subjects are referred to as "the alcohol group."

Here we present only the main findings for this group. For more details about objectives and procedures of this study, readers are invited to contact the principal investigator, whose address appears at the end of this article.

When homeless respondents with alcohol problems are compared with the remainder of the respondent group, some interesting contrasts emerge (see Table 1). For example, the alcohol-problem respondents were more likely to be older men who were divorced or separated. A large proportion of this group was veterans. An even larger proportion reported having been in jail or prison. Furthermore, respondents with alcohol problems had been homeless for a longer period of time and appeared to be more transient than nonalcoholic respondents (see Table 2).

Table 2. Number of places stayed in the past month by alcohol-problem respondents (n = 204) and other interviewees (n = 775) in the Ohio homelessness study. (Source: Alcohol Problems and Homelessness: Findings from the Ohio Study)

Number	Alcohol Number	Alcohol %	Others Number	Others %	Total Number	Total %
1–2 places	90	44.1	469	60.5	559	57.1
3–4 places	58	28.4	187	24.1	245	25.0
5–6 places	18	8.8	51	6.6	69	7.0
7–8 places	8	3.9	12	1.5	20	2.0
More than 8 places	24	11.8	33	4.3	57	5.8
No answer	6	2.9	23	3.0	29	3.0
Total	204	99.9	775	100.0	979	99.9
Mean number of places	4.3		3.0		3.3	
Median number of places	3.0		2.0		2.0	

Nearly one-third of the alcohol problem respondents were born in the counties in which they were interviewed. However, of those who migrated, members of the alcohol group were more likely to say that they were "just passing through" compared to those in the nonalcoholic group.

While this simple demographic profile paints a picture of the group as alienated, it is also apparent that these respondents are resourceful. They were most likely, for example, to have worked and were slightly more likely to have some income. Their resourcefulness is less related to work behavior and income, however, than it is to the use of social services. In comparison with homeless people without alcohol problems, those who reported such problems tended to make more use of community kitchens, shelters, and—to a lesser extent—hospital emergency rooms and community mental health centers.

Finally, alcohol problems were linked with other difficulties. More frequently than homeless respondents without alcohol problems, the alcohol group reported physical health problems and were likely to have used and had trouble with nonprescribed drugs or medications. Also, the alcohol-problem group experienced higher rates of psychiatric hospitalization and, at the time of the interview, was more likely to have demonstrated problematic psychiatric symptoms.

These findings indicate that homeless people with alcohol problems are very likely to have human service needs that are not being met. Most obvious are (1) the need for housing and (2) the need for services targeting alcohol use. In addition, employment or training opportunities, health care (both physical and mental), and the development of social supports are all areas where needs of this group were demonstrated in the Ohio study. ☐

For more information, contact the principal investigator, Dee Roth. Her address is Office of Program Evaluation and Research, Ohio Department of Mental Health, 30 East Broad Street, Room 1340J, Columbus, OH 43215.

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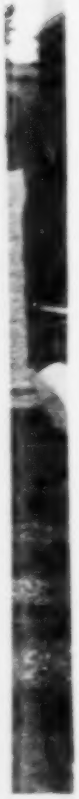
Alcohol and Drug Abuse Among American Military Personnel:

Prevalence and Policy Implications



Courtesy Department of Defense

John Allen, Ph.D., M.P.A.
John Mazzuchi, Ph.D.

Initial data analyses of the 1982 Worldwide Survey of Drug and Alcohol Use Among Military Personnel (Bray et al. 1983), which was conducted by Research Triangle Institute, have now been completed. These surveys are conducted periodically among servicemembers and are used as the primary means for monitoring the prevalence and the impact of drug and alcohol abuse. The survey findings assist the Office of the Assistant Secretary of Defense for Health Affairs in responding to concerns of Congress, medical personnel, military program managers, and the general public. The survey also serves as an important basis for the Department of Defense (DoD) in developing policies to prevent drug and alcohol abuse problems and to treat personnel with these problems. The following article summarizes major conclusions of the 1982 survey, comments on differences between these findings and those of the previous survey (Burt and Biegel 1980), and discusses some of the policy implications of the 1982 survey results.

Survey Methodology

The survey instrument consisted of 109 pencil-and-paper items with specific response alternatives. Many items allowed for multiple responses.

This questionnaire was similar to that employed in the 1980 survey. The sampling design consisted of two phases. In the first, military units were stratified by service and by location in four geographic regions, except that Navy and Marine personnel in Europe were sampled jointly. Units then were selected in proportion to manpower strength. The second phase of sampling involved random selection of personnel within five rank strata (E1–E5, E6–E9, WO1–WO4, O1–O3, and O4–O6), according to line items on the personnel rosters. No weighting was done in the sample selection. The number of respondents was 21,936 (i.e., 85 percent of those personnel identified and who were not ineligible to participate because of separation, death, or AWOL). Because of the sensitivity of the questionnaire content, special efforts were made to assure the anonymity of the subjects.

For the most part, the survey questionnaire was administered to groups of approximately 50 servicemembers. Individuals unable to attend a survey session were presented the questionnaire by the installation military liaison officer. While the group session survey was conducted during August and September of 1982, the "makeup" phase continued into the early part of 1983. The survey instrument and methodology had been pretested to assure intelligibility of the questions.

Alcohol Consumption

As shown in Table 1, most military personnel had consumed alcohol in the preceding 30-day period. DoD-wide, the percentage of personnel who drink had changed very little since 1980. Across services, however, some differences are seen: the percentages of Army and Air Force personnel who drink had increased, but the Navy and Marine percentages had decreased. Within the Army and Air Force, this increase had occurred at all ranks except senior officers.

Table 1 suggests that for enlisted personnel, the tendency to drink declines as rank increases. For officers, however, the

Table 1. Percentage of Personnel Who Had Consumed Alcohol in the 30 Days Prior to the Survey

Rank Groups	Army	Navy	Marine Corps	Air Force	Total DoD
E1–E5	87 (81)	80 (88)	83 (86)	85 (82)	84 (83)
E6–E9	83 (75)	81 (78)	82 (83)	85 (78)	83 (77)
W01–W04	82 (76)	79 (80)	* (*)	* (*)	83 (76)
01–03	90 (80)	89 (88)	84 (91)	91 (82)	90 (83)
04–06	92 (92)	94 (94)	100 (84)	90 (90)	91 (91)
Total	86 (80)	81 (86)	83 (86)	86 (82)	84 (83)

**Fewer than 20 respondents in cell or does not apply.*
Note: *1980 data in parentheses.*

percentage of drinkers tends to rise as rank increases.

Table 6 (p. 17) shows that most males between 18 and 25 in our society drink at least once a month (Miller et al. 1983). The data also suggest that the gap has widened between the civilian and military populations. While the 1980 data are based on both males and females and the 1982 data are for males only, the differences between demographically comparable military and civilian populations had gone from 2 percent to 10 percent, with personnel in the military being more likely to drink.

Of greater interest than simply drinking is excessive daily consumption of alcohol. Table 2 displays rates of heavy daily consumption by rank and by service. Heavy daily consumption was defined as 3.5 or more oz of pure ethanol per day. (A standard drink of an alcoholic beverage contains approximately one-half an ounce of pure ethanol.) Across the services, there seems to have been a decrease in heavy daily consumption since 1980. In particular, a smaller percentage of junior Marine enlisted personnel is now found in the heavy-drinking category.

A countertrend was seen among senior Army officers, 7 percent of whom reported heavy daily alcohol consumption. This figure not only is higher than for officers of comparable rank in the other services but also represents a dramatic rise above the 1-percent 1980 figure.

Analysis of the 1982 survey included a regression equation, which was used to identify demographic, psychological, and behavioral factors associated with average daily alcohol consumption levels of enlisted personnel. In this analysis, a larger number of variables was statistically regressed against consumption levels, with the regression coefficient of each predictor simultaneously adjusted for its correlation with all other predictors. Hence the coefficients represent the unique contribution of each predictor. Table 3 presents a list of predictors found to have a positive correlation with daily consumption at *p* less than or equal to .05.

In order to understand the predictors, some definitions are required:

- The problem behavior index score consists of seven items dealing with Universal Code of Military Justice offenses, traffic violations, aggressive episodes, and incarceration.
- The alcohol social support index involves the extent to which the respondent believes his social and military lifestyles encourage drinking.
- The drinking motivation index comprises responses for personal psychological reasons for not drinking.

The squared multiple correlation coefficient based on these predictors and a number of other items showed that 24 percent of the variance in alcohol consumption is shared by the regression factors. The psychological/behavioral item series was found to account for slightly over three times as much variance as the demographic variable combination. This is encouraging, because the services have more potential to modify the former variables than to change the demographic ones.

Effects of Alcohol Consumption

Table 4 summarizes the data on serious adverse consequences caused by drinking in the past year. Comparing 1982 and 1980 figures suggests that alcohol use resulted in a reported increase in work impairment in 1982. This effect is seen in all the services. The diminished work performance index consists of four questions dealing with self-reported problems associated with alcohol use: lower performance, leaving work early or arriving late, not coming to work at all, or being intoxicated on the job. According to the responses to these questions among all ranks and all services, generalized lower performance was most commonly reported. Unfortunately, this response alternative is global in nature and does not clearly identify the precise type of job performance decrement. Future survey questionnaires may well be able to define losses in work performance with greater precision. Beyond overall declines in productivity, a large percentage of the respondents, particularly among junior enlisted personnel, also reported that alcohol use was related to their coming late to work, leaving early, or being intoxicated on the job.

While Table 2 indicates there has been a slight decrease of heavy daily consumption, Table 4 suggests that alcohol use is now associated with more serious deficits in work performance. The reasons for this are not clear. It could be that isolated instances of inebriation may lead to negative effects in work, or it could be that consumption of fewer than seven drinks per day may impair performance. Another possibility is that respondents may have become more sensitized to the effects of alcohol on their daily work performance since 1980.

Drug Use

More favorably, the survey results suggest that the military is making considerable progress in curbing drug abuse. Table 5 shows that, among junior enlisted service members, abuse of drugs in general and of most specific drugs had declined substantially between 1980 and 1982. While one-fourth of the E1–to–E5 personnel report using drugs illicitly during the prior 30 days in 1982, this figure is 34 percent lower than the 1980 rate. The reduction is even more impressive in the Navy and the Marine Corps, where rates have declined by approximately 50 percent. Drug abuse remains least prevalent in the Air Force. While illicit use of drugs has diminished to a smaller extent within the Army, recent data from "unit sweep" urinalyses in Europe suggest that the Army is now experiencing a similar decline. This is particularly important because among Army personnel in particular, the drug abuse problem in Europe seems more severe than in other geographic areas.

Table 2. Percentage of Personnel Consuming an Average of 3.5 or More Ounces of Alcohol per Day

Rank Groups	Army	Navy	Marine Corps	Air Force	Total DoD
E1–E5	18 (21)	19 (22)	14 (22)	9 (11)	15 (19)
E6–E9	7 (8)	5 (6)	5 (7)	(4)	6 (6)
W01–W04	1 (1)	1 (1)	* (*)	* (*)	2 (1)
01–03	3 (3)	3 (3)	* (1)	1 (1)	2 (2)
04–06	7 (1)	0 (0)	2 (2)	3 (0)	3 (2)
Total	14 (16)	15 (15)	12 (19)	7 (8)	12 (14)

**Fewer than 20 respondents in cell or does not apply.*
Note: *1980 data in parentheses.*

Table 3. Correlates of Average Daily Consumption of Alcohol During the Past Twelve Months Among Enlisted Personnel

Regression Predictors

Demographic Variables

Hispanic vs White
Male vs Female
Spouse not present vs spouse present
Stationed in Europe vs in the Americas

Psychological/Behavioral Variables

Problem behavior index
Use marijuana vs uses no drugs
Use drugs other than marijuana vs use marijuana only
Alcohol social support index

Drinking motivation index

Smoking level
Need a drink at work question

Table 4. Adverse Consequences of Alcohol Use in the Twelve Months Prior to the Survey

Consequences	Army	Navy	Marine Corps	Air Force	Total DoD
Diminished work performance	33 (24)	42 (35)	38 (34)	28 (20)	34 (27)
Physical damage	12	13	10	6	10
Social disruption	12	13	14	6	11
Other consequences	19	21	23	11	18

Note: *1980 data in parentheses.*

Table 5. Percent of Personnel E1 to E 5 Abusing Psychoactive Drugs in the Past 30 Days

Drug Type	Army	Navy	Marine Corps	Air Force	Total DoD
Cannabis	31 (40)	17 (47)	21 (47)	15 (20)	22 (37)
Amphetamines/Stimulants	7 (8)	7 (15)	7 (10)	3 (4)	6 (9)
Cocaine	5 (6)	4 (11)	4 (10)	2 (2)	4 (7)
Hallucinogens (Other than PCP)	4 (3)	2 (7)	5 (10)	1 (2)	3 (5)
Tranquilizers	2 (3)	2 (4)	2 (3)	1 (1)	2 (3)
Barbiturates	2 (4)	2 (5)	1 (4)	1 (1)	2 (3)
Opiates (other than heroin)	1 (2)	1 (2)	1 (2)	0 (1)	1 (2)
PCP	1 (2)	1 (2)	1 (4)	0 (0)	1 (1)
Heroin	1 (2)	1 (2)	1 (0)	0 (0)	1 (1)
Total abusing at least one drug	34 (41)	21 (48)	25 (48)	18 (21)	25 (38)

Note: *1980 data in parentheses.*

An unpublished 1983 survey of the marine Corps indicates further reduction in that service's rates of drug abuse, with 19 percent reporting use of any illicit drug in the prior 30 days and 17 percent admitting to use of cannabis. Marine urinalysis results support this further decline in drug abuse since the 1982 survey. As shown in Table 6, drug use rates among military personnel now compares favorably with those of U.S. civilian personnel matched on age, sex, education, and marital status. While military personnel remain more likely to abuse stimulants, this disparity has also narrowed considerably.

The survey results do not elucidate possible reasons for the larger decline in drug abuse among military personnel than among their civilian counterparts. Speculative reasons include the following:

- More stringent enlistment standards between 1980 and 1982, based on the services' greater success in satisfying end-strength requirements;
- More intensive employment of mandatory urinalysis, including larger numbers of tests, sensitivity of the tests to detect cannabis, and widespread use of field-testing equipment; and
- Greater efforts in preventive education on drug abuse as well as heightened command emphasis on suppressing the problem.

Table 6. Comparison of Military and Civilian Rates of Nonmedical Drug and Alcohol Use During the 30 Days Prior to the Survey

Drug	Military	Civilians
Alcohol	86 (84)	76 (82)
Marijuana	25 (40)	35 (42)
LSD/Hallucinogens	4 (5)	2 (45)
Cocaine	5 (7)	9 (10)
Stimulants	7 (10)	5 (4)
Tranquilizers	2 (3)	2 (3)
Heroin	1 (1)	0 (1)

Note 1: *1980 data in parentheses*
Note 2: *1980 data include males and females. 1982 data are for males only*

The reduction in abuse is likely a reflection of all these and other undefined factors.

Table 7 is based on the same statistical model as Table 3 but considers only enlisted personnel, since this is the predominant high-risk group for drug abuse. The criterion was an either-or measure, use vs nonuse of drugs. Most of the predictors are either self-explanatory or have been defined in conjunction with Table 3. A few, however, are unique:

- The drugs impair health/work index is based on a brief series of questions dealing with the respondent's belief that drugs may cause work problems or may damage psychological or physical health.
- The drug social support index includes questions on the degree to which the individual believes that drug abuse is acceptable social behavior within the military context.
- The drug treatment climate index deals with the extent to which the servicemember feels that the installation personnel will support drug abusers' efforts to obtain treatment.

Perhaps the most important finding is that drug abuse and alcohol abuse are predictive of each other.

Effects of Drug Use

Not only did drug abuse decline substantially in the services during the 2-year interval between surveys but the percentage of personnel reporting that drug abuse had harmed their work performance also

Table 7. Correlates of Illicit Use of Psychoactive Drugs During the Prior 30 Days Among Enlisted Personnel

Regression Predictors

Demographic Variables	Psychological/Behavioral Variables
Army vs Air Force	Problem behavior index
Air Force vs Navy	Drugs impair health/work index
High school completion vs less	Drug social support index
Spouse present vs no spouse present	Drug treatment climate index
Stationed in Europe vs North Pacific	Need an upper at work question
E1–E5 vs E6–E9	Alcohol social support index
Age in years	Alcohol treatment climate index
	Drinking motivation index
	Daily ethanol consumption level

had similarly decreased. The Department-wide diminution was 33 percent, which closely parallels the 34 percent decrease in E1–to–E5 personnel reporting abuse of drugs in the prior 30 days. The data analysis suggests that drug use is not associated as clearly as alcohol use is with perceived physical consequences. However, drug abuse appears more detrimental to social relationships (e.g., marital disharmony and legal problems) as well as to "other" consequences such as failure to be promoted, entry into rehabilitation, and family violence.

Major Findings

While a slightly larger percentage of military personnel consumed alcohol on at least a monthly basis in 1982 than in 1980, and more drank than did their civilian peers, the percentage of those who engaged in extremely heavy daily consumption (3.5 + oz of ethanol) had for the most part declined. Use of alcohol, nonetheless, appears to affect adversely the work performance of a substantial percentage of military personnel; and the problem appears to have grown worse since the 1980 survey. Of particular concern is the increase in consumption among senior Army officers.

By 1982, as compared with 1980, drug abuse among military personnel had declined dramatically and appeared to be less common in the military than in a comparable civilian sample. Likewise, drug abuse appeared to be having less effect on military job performance. That 25 percent of the E1–to–E5 servicemembers used illicit drugs at least once a month is cause for serious concern.

Policy Implications

Besides indicating the nature and extent of the alcohol and drug abuse problem among military personnel, results of the 1980 survey caused DoD officials to reevaluate basic program and policy issues. Until publication of the 1980 survey, drug abuse was considered synonymous with drug addiction. DoD policies and, therefore, DoD programs emphasized treatment, often in the form of intensive individual counseling. Nearly 50 percent of the DoD budget for drug and alcohol abuse was being spent on treatment.

The 1980 survey proved earlier assumptions to be incorrect, at least regarding the DoD drug abuse problem. With respect to illicit drug abuse, there was little evidence of dependence, and, although alcohol dependence was substantially higher, the characteristic military drug and alcohol abuse problem appeared to be more a lack of discipline than addiction (Beary et al. 1983). As a result of these findings, DoD placed greater emphasis on prevention. While treatment was still available to those who needed it, policies and programs became more punitive. Deterrence through urine testing and the use of urinalysis results in disciplinary proceedings became the primary efforts toward prevention.

Because the 1980 survey indicated that marijuana and alcohol were the most abused drugs, DoD policy began to focus on these two substances. The Armed Forces Institute of Pathology developed a procedure for conforming urine samples screened positive for cannabis in 1981. Urine testing for cannabis became the main thrust of the DoD drug abuse identification program. To combat the abuse of alcohol, the Secretary of Defense issued a stringent new policy aimed at reducing the incidence of drunk driving. This policy took the form of a memorandum to the Secretaries of the military Departments in 1982, followed by a Defense Department directive in 1983.

The findings of the 1982 survey again illustrated that alcohol and marijuana were the drugs most abused by military personnel. The use of marijuana, however, had declined sharply. For policymakers, this fact was seen as a vindication of the change in emphasis from treatment to prevention. Even so, reported marijuana use was substantial, and alcohol use was accounting for a decrease in work performance. The emphasis on prevention, espe-

Continued on page 52

Table 8. Adverse Consequences of Drug Usage in the Past Twelve Months Among E1–E5 Personnel

Consequences	Army	Navy	Marine Corps	Air Force	Total DoD
Diminished work peformance	18 (22)	15 (28)	11 (28)	7 (9)	14 (21)
Physical damage	3	2	2	0	2
Social disruption	11	11	10	4	9
Other consequences	12	12	11	4	10

Note: *1980 data in parentheses*

New Worldwide Drug and Alcohol Survey Will Explore 'Critical New Issues'

The Department of Defense (DoD) has begun to accept proposals and cost estimates for conducting the 1985 Worldwide Drug and Alcohol Survey. This is the third such survey designed to estimate the extent of alcohol use, problem drinking, and drug abuse among members of the U.S. Armed Forces. As with the previous surveys (1980, 1982), it will also include items to consider the effects of alcohol and drug abuse on performance, health, and social relationships. Further, it will identify the sociodemographic characteristics of abusers. This type of information will help Congress, the Office of the Secretary of Defense, Service Headquarters personnel, and local programs to allocate resources and formulate program strategies to combat drug and alcohol abuse. Although the 1985 survey will attempt to provide more managerially relevant information than the earlier surveys, it will repeat previous questions to permit the establishment and analysis of trends in drug and alcohol abuse over the past 5 years.

Sampling

The survey will employ a random sampling model. The design will guarantee representation by the four major geographic locations to which military personnel are assigned, the four services, and the rank structure of the armed services.

DoD has predetermined the level of precision that the estimates of alcohol and drug abuse must satisfy. Using data from the 1982 survey to determine necessary sample size, it is believed that very precise estimates can be derived. Also, by employing the same sampling methodology, monies will be saved and the project can commence earlier.

Administration

The survey will be administered primarily to groups of respondents at various sites. Contract civilian proctors, rather than senior uniformed officials, will do the administering in order to mitigate possible fears of violation of confidentiality.

New Issues to Be Explored

While repeating many items from the two previous surveys, the 1985 survey will explore several new issues.

For the first time, the DoD will attempt to contrast rates of alcoholism among servicemembers with rates among comparable civilian segments of the population. Samples of military and civilian personnel will be statistically matched against sociodemographic characteristics associated with serious alcohol abuse. Previously included questions to assess alcohol dependency and problem drinking will still be asked of military respondents to allow trend analysis of the data.

New Measures of Work Performance

The 1982 survey yielded strong indications that alcohol misuse was associated with decreased work performance. Approximately one-third of the respondents reported that alcohol consumption had impaired their work performance at least once during the previous year. The nature and severity of this loss of productivity could not be determined on the basis of the small number of relevant survey questions. The upcoming survey will include specific measures of impaired performance as absenteeism, accidents, accuracy of performance, relationships with coworkers, and development of new technical skills. It will be possible to contrast servicemembers with drug or alcohol problems with those who do not suffer such problems on the important variables.

The 1985 survey will be expanded to consider a broader range of health-risk behaviors, in addition to drug and alcohol abuse, among military personnel. These will include smoking, dangerous driving habits, and dietary indiscretion. If such health-risk behavior patterns are related and constitute unitary unhealthy lifestyle patterns, then drug and alcohol abuse prevention efforts might be more productive if integrated with DoD initiatives that address these other problems. This research question is of great relevance to DoD and to major civilian employers because in recent years much greater emphasis has been placed on health promotion activities at work.

Early Identification of Problem Drinkers

For the first time, the 1985 Survey will attempt to determine the relative impact of various factors that make servicemembers with drug or alcohol problems reluctant to enter military-sponsored treatment programs. These factors have been studied in the past but only at a local level. While DoD's ability to enroll servicemembers with problems in treatment is better than in most private-sector firms, a big concern of DoD is the need to identify and treat problem drinkers early enough. If the factors that discourage voluntary enrollment can be discovered and evaluated, it may be possible to revise program policies and regulations to make treatment more inviting to those in need of these services. Also, it may be that many alcoholic servicemembers who choose not to enter treatment may have erroneous conceptions regarding military-sponsored treatment. If DoD understands the scope of these misconceptions, it can initiate efforts to dispel them.

Finally, data from the 1985 survey should be subject to greater generalization than previous worldwide surveys. Secondary statistical analyses of the 1982 survey suggested that those who participated in the initial phase of the survey differed from those who did not. Therefore, a concentrated effort will be made to follow up a random sample of personnel who were selected for the survey but were unable to complete it with the rest of the respondents at the site. Using these data, rates of abuse can be "corrected" statistically for rates among nonparticipants.

As with past DoD-wide surveys, the 1985 Worldwide Drug and Alcohol Survey will require allocation of major financial, manpower, and data analysis resources. Without abandoning previous goals, its content and methodology will be extended to explore critical new issues. □

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(Portions of this sidebar were adapted with permission from Alcoholism Update *8(1), January–March, 1985, pp. 4, 6)*

Domestic Violence and Alcohol

Barriers to Cooperation

Courtesy International Association of Chiefs of Police

Arleen Rogan

For more than a decade, practitioners and researchers have noted that alcohol abuse and domestic violence frequently occur in the same families (Gelles 1972; Hindman 1979; Roy 1977). For this reason, many who have worked with dually affected families have cited the necessity for developing cooperation among alcoholism counselors and those who work in the domestic violence field (Lehmann and Krupp 1984*b*; Potter-Efron and Potter-Efron 1985; Wright and Popham 1982). In some instances, practitioners and researchers have called for an integration of services to provide for those clients in whom these problems overlap (Lehmann and Krupp 1984*b*). But despite this widespread agreement in the literature that such collaboration is imperative if the cycles of alcohol abuse and battering are to be successfully interrupted, there remains a reluctance on the part of many in both treatment areas to work together and, to date, few programs have successfully integrated services to assist families suffering from both problems (Hans 1985; Lehmann and Krupp 1984*a*; Potter-Efron and Potter-Efron 1985).

This article reviews some of the reasons for service-provider cooperation in these fields; examines some of the gaps in knowledge, conflicting attitudes, and practices that impede development of such cooperation; and discusses some of the experiences of those who have worked with dually affected families.

Reasons for Cooperation

The most frequently cited reason for establishing cooperative links among practitioners in the two fields is the close association of alcohol abuse and domestic violence: many families suffer from both problems. Some researchers have estimated the incidence of alcohol problems in families experiencing violence to be as high as 80 percent (Roy 1977). Others set the incidence at 50 to 75 percent (Katz 1982); and still others put it in the range of 25 to 30 percent (Flanzer 1984). No research data support the contention that alcohol causes men to batter or that family violence causes alcohol abuse, but many practitioners believe that the two problems interact, each exacerbating the other (Flanzer 1984; Gibbons 1985).

When alcoholism counselors and those who work in the area of domestic violence do not understand how frequently the two problems are associated, or if they fail to recognize the impact that such dual affliction has on their clients, they may miss an important opportunity to intervene in the cycles of abuse (Potter-Efron and Potter-Efron 1985). If lack of knowledge is further compounded by erroneous attitudes about alcohol abuse or domestic violence, such counselors and workers will continue to be reluctant to seek referrals for clients (Hans 1985; Wright and Popham 1982).

Lehmann (1985) notes that many advocates for victims of abuse are wary of the trend toward family therapy in alcoholism treatment. Such workers are concerned that unless alcoholism counselors are alert to the possibility of violence in families where alcohol abuse is a problem, the violence will remain unnoticed, and potentially dangerous situations will continue unimpeded (Flanzer 1984; Hans 1985).

In addition, if counselors are not sensitive to the patterns of spouse abuse and the role that alcohol can play in the abuse dynamic, they run the risk of relying on treatment techniques that inadvertently blame the victim for engaging in "enabling" behaviors while presumably absolving the "ill" abuser of responsibility (Wright and Popham 1982).

Hans (1985) believes that similar gaps in knowledge exist among those who work with the victims of domestic violence. She notes that many such workers believe that alcoholism treatment is concerned only with achieving sobriety. But, she notes, that is only the first step: "If someone is really working the AA (Alcoholics Anonymous) program and is being counseled for alcoholism, he comes to learn that he really has to make positive changes in his life. It is often the case that the domestic violence worker does not understand what alcoholism treatment is all about."

The literature frequently points to the similarities that exist between family violence and alcohol abuse (Flanzer 1984; Potter-Efron and Potter-Efron 1985; Sanchez-Dirks 1979). Many have noted that both problems are intergenerational (e.g., Flanzer 1984; Sanchez-Dirks 1979). Flanzer (1984) reports that in his view the most significant similarity is that neither problem drinking nor family violence abates until some sort of crisis occurs. Also, alcohol abusers and batterers both tend to blame their victims for their behavior and both tend not to remember details surrounding events related to their problems (Flanzer 1984). Victims of violence and spouses of alcoholics, on the other hand, tend to be isolated and to accept guilt and blame for the abuser's be-

Courtesy International Association of Chiefs of Police

Though alcohol abuse and domestic violence frequently occur in the same households, few programs have successfully integrated services to assist families suffering both problems.

havior (Flanzer 1984). Both partners in both types of families tend to have a dependent attitude, to have low self-esteem, and to be impulsive (Potter-Efron and Potter-Efron 1985).

In addition, families experiencing violence and those experiencing alcohol-related problems are both characterized by "an acceptance of loss of control as a means of coping with the world" (Potter-Efron and Potter-Efron 1985). And, finally, both types of abuse seem to be associated with retarded emotional development among family members (Potter-Efron and Potter-Efron 1985). However, alcohol abuse and violence also appear to provide payoffs in the shortrun in that they "resolve a problem, establish mastery over the moment, and reduce feelings of hopelessness, depression, and despair" (Flanzer 1984).

Barriers To Communication

Why, then, is there so much reluctance on the part of program planners and practitioners to form the links and to integrate alcoholism and domestic violence services when appropriate? The answer lies, in part, in the knowledge gaps, disparate attitudes among helping professionals, and the treatment practices characteristic of these two different areas.

Along with the apparent recognition of the close association of the two problems, there coexist multiple interpretations about what that association means. Also, even when practitioners agree on the interactive nature of these problems, there remains a wide range of views about how best to intercede. These differences in approach often are predicated upon different frames of reference for explaining how the problems arise and how to allocate responsibility for change. While the research data reveal the frequency with which these problems are associated, the answer as to how best to resolve them has not yet been developed.

Today, among treatment professionals there exists a broad range of explanations for how to treat alcoholism, domestic violence, and the relationship between the two problems. These explanations in part determine the nature of the services provided as well as the objectives for those services. What follows is a brief review of the issues that separate alcoholism professionals from those who work in the field of domestic violence, together with some suggestions and comments from those who work with dually affected families.

Gaps in knowledge and experience—Alcoholism counselors and those who work with victims of domestic violence often have little training in each other's fields. Alcoholism counselors, for instance, frequently don't know how widespread domestic violence is, in part because their clients are reluctant to reveal events about which they may feel shame (Hans 1985). Domestic violence workers have little knowledge about what alcoholism treatment is all about and often fail to refer clients who might benefit from those services (Lehmann and Krupp 1984*a*).

A recent study of workers in both fields (Lehmann and Krupp 1983/84) revealed that alcoholism counselors often are not aware of services available for victims of domestic violence or their abusers and that some are unsure of the necessity for coordinating such services with treatment for alcohol problems. The same study indicated that although domestic violence workers make referrals to agencies who provide services for alcohol-related problems, their knowledge is often limited to such services as Alcoholics Anonymous and Al-Anon. Furthermore, the domestic violence workers in this study did not know how to recognize and deal with client problems that are associated with alcoholism.

Attitudes and Practices—Those who work with clients with drinking problems and those who work with victims of domestic violence often differ in their approaches to the dually afflicted family. These disparate approaches frequently spawn attitudes that can interfere with understanding how to help the clients and can create barriers toward cooperation in providing service that might truly aid such a family.

Despite lack of supporting evidence, alcoholism counselors often believe that domestic violence is a symptom of alcoholism (Gibbons 1985; Hans 1985; Wright and Popham 1982) and assume that once sobriety is achieved, the violence will abate. For the provider of services to victims of abuse, on the other hand, the violence is the primary problem (Lehmann and Krupp 1984*a*; Wright and Popham 1982).

In addition, some providers to victims and perpetrators of violence believe that battering and other forms of domestic violence result from cultural beliefs favoring violence as an acceptable way of controlling others (Wright and Popham 1982) or from social tolerance of violent behavior (Gibbons 1985).

The issues of what causes violence, how to assign responsibility in dually affected families, what role alcohol plays in domestic violence, whether to treat the violence or the chemical dependency first, and whether to provide individual or group counseling—all are areas of disagreement among those who provide services.

Treating family violence as a symptom of alcoholism is a key issue in view of the current trend to treat alcoholism as a family disease. This approach becomes problematic if the counselor does not recognize that violence is a specific problem requiring specific treatment (Hans 1985; Lehmann 1985; Wright and Popham 1982).

In addition, many who treat alcohol problems believe that the partner who does not have a drinking problem "enables" the partner who does drink to do so abusively. This concept of enabling behavior is viewed with suspicion by many domestic violence workers because they believe that the behavior referred to as "enabling" is very often the same behavior that allows victims of abuse to survive (Lehman 1985; Wright and Popham 1982). Furthermore, those who work with victims of violence believe that until a woman feels safe from violence, she will be unable to examine her behavior as it relates to her husband's chemical dependency.

The issue of responsibility is a crucial one for those who work with dually affected families. Hans (1985) contends that personal responsibility is a key treatment issue for both abusers and victims because each tends to blame the other: "She says, 'if only you'd stop drinking'; he says, 'if only you'd stop nagging.' " Hans cautions that "it is important to achieve some separation because these couples are so enmeshed" (Hans 1985).

The major objective of Abusing Men Exploring New Directions (AMEND), a Denver-based treatment program for batterers (see sidebar this page), is to help clients take responsibility for their own violence (Katz 1982). Many batterers who enter treatment do so because they are pushed into it. They then blame their difficulties on whoever pushed them—the police or their wives—and refuse to acknowledge responsibility for their behavior (Gibbons 1985).

Neidig and his coworkers (1985) believe that both partners participate in abusive behavior. The Domestic Conflict Containment Program (DCCP), a program designed to assist troubled families in the Marine Corps, does stress, however, that abusers must accept responsibility for their violent behavior. The DCCP strives to achieve a difficult therapeutic balance:

> It is important that the facilitator maintain a balance . . . between being too confrontive (which would mobilize defenses and resentment) and too accepting (which would permit the avoid-

AMEND: Help for the Alcoholic Batterer

Abusing Men Exploring New Directions (AMEND) is a Denver-based program that provides long-term counseling to men who are identified as batterers. AMEND also conducts training sessions for staff members of other agencies that deal with domestic violence.

The program was founded in 1976 as a result of the experiences of a group of men who were working with the victims of battering. Recognizing a need for services designed to treat batterers and the reluctance of private practitioners to counsel batterers, the founders formed AMEND to fill the gap in service delivery.

AMEND services were shaped by the emerging awareness that men who are violent—and frequently alcohol-abusing—could benefit from therapy. Until recently, participation in AMEND services was on a voluntary basis. In 1984, however, Colorado enacted legislation requiring police to make an arrest every time they responded to a domestic dispute call—whether or not the woman pressed charges. AMEND initiated its court-ordered program to treat the men who chose counseling in lieu of serving a jail sentence.

AH&RW staff interviewed Gary Gibbons, director of AMEND, to provide some insight into the link between domestic violence and alcohol abuse.

AH&RW: Can you describe the program?
GG: Unlike other programs around the country, we focus on long-term services. The court-ordered program, for instance, is 24 weeks long. Our voluntary program is 36 weeks long and has a two-level structure. In level one, we begin with crisis groups, where we educate men about violence and help them to control their violence.

After a group gains some cohesiveness—after 6 or 8 months—we close the group and it may continue for another 2 years. During this time, men work on their feelings and learn how to risk and open up.

AH&RW: You work a lot with batterers who drink. How do you incorporate alcohol treatment services into your program?
GG: Very soon after we implemented the court-ordered program, we recognized that many of these men had serious alcohol problems. By any alcohol evaluation scale, many were first- and second-stage alcoholics, and some of them were third-stage alcoholics.

By first stage, I mean, maybe they've had a blackout, maybe a DUI, but they still think they can drink socially. They have not consistently experienced loss of control.

By second stage, I mean they exhibit characteristics like domestic violence and problems on the job.

By third stage, I mean they have physiological symptoms—damage to pancreas, liver, or esophagus; hypertension; etc. The data show that men who are in this third stage of alcoholism very rarely get better even with intensive treatment.

With the help of one of the directors of a local alcohol program, we designed a program that combined a DUI education program with a domestic violence program. For instance, we will conduct an ance of responsibility) (Neidig et al. 1985, p. 201).

Many who work with women who are victims of abuse are reluctant to acknowledge a woman's facilitative role in her own victimization. Wright and Popham (1982) assert:

> Battered women do not provoke violence, are not sick, do not need therapy, and are not addicted to the violence perpetrated upon them . . . the concept of 'enabler' is inappropriate when dealing with the violence perpetrated on battered women. (p. 57)

These conflicting attitudes are reflected in the types of services provided to those with alcohol problems, batterers, victims of abuse, and families affected by alcohol problems. As a result, services that are provided to dually affected families are frequently fragmented and sometimes provide conflicting messages.

Wright and Popham (1982) go on to delineate the fragmentation as one of focus:

> The (alcoholism) field focuses primarily on the individual abuser, providing services to the other family members largely in support of the abuser's efforts to end his chemical dependence. Woman abuse programs deal primarily with the victims of abuse, helping them to restructure their lives to become free of the abuser's violence. (p. 56)

Those who provide services in woman abuse programs do not believe women are in need of therapy but they need "skills for living a life at least temporarily independent of the abuser" (Wright and Popham 1982).

Many who work in the domestic violence field recognize that many women return to husbands who have abused them (Gibbons 1985; Hans 1985). These workers emphasize the importance of providing services for the alcohol abuser and the batterer and of coordinating these services with those for the victims of battering. However, even these practitioners differ in their opinions on delivery of services.

Lehmann and Krupp (1984*a*), noting that it is important to view the family as a system, caution that "in families dually affected by alcoholism and domestic violence, couples or family counseling should not begin until the abusive behaviors are controlled." Flanzer (1984) believes that successful treatment of such troubled families requires that both the chemical dependency and the violence must stop before progress can be made. But, he notes, because of the dangers inherent in violence, "family violence must take precedence as the treatment focus." Wright and Popham (1982) concur, noting that the "primary problem for the woman with a violent, chemically dependent partner is the violence."

Neidig and his coworkers (1985), however, believe that both partners contribute to abusive behavior, though not necessarily in equal proportions or in similar ways. It is essential, therefore, that the partners be dealt with together because intervention that requires "rescue of the wife and individual treatment or punishment for the husband frequently compounds the problem."

Hans (1985) stresses the importance of both members of a couple receiving individual counseling. In her view, the locus-of-control problem—that is, inability or unwillingness to assume responsibility—is an issue for both partners, as is the emotional enmeshment each feels. Lehmann and Krupp (1984*b*) concur, noting:

> When the abuser attains sobriety and demonstrates that he can interact with the battered spouse without being violent or coercive, then couples counseling may be appropriate to redefine

education session on the emotional effects of alcohol—loss of judgment, euphoria, depression, rage—and we go through the whole drinking cycle.

We point out that as you begin to sober up, your stress level increases. We then tie that into the violence issue by pointing out where in the drinking cycle a person is likely to get into an argument. We discuss alcohol as a means of seeking relief from stress and pain. We also discuss the use of alcohol to give permission to be violent.

We conclude by saying that if you want to change and not be violent in your relationship, you will probably have to give up drinking. We then open the floor for a discussion of this conclusion.

AH&RW: Is abstinence from alcohol one of the goals of the program?

GG: Actually, it's a requirement for attending the program. The court-ordered program is a mandatory Antabuse program. We get some resistance from clients, and we do allow for some flexibility. For instance, if a man works in an environment in which he would get sick if he were taking Antabuse, we excuse him from taking it. We do have a dropout rate because some people prefer going to jail. And then there are people who cannot stay sober even with Antabuse.

AH&RW: Can you draw us a profile of the batterer with an alcohol problem?

GG: I see a really broad range of men who have problems with violence and alcohol. There are certain character types, however. For example, there's the obsessive, overcontrolling guy. He's that way in his marriage. He uses alcohol to control his pain and he uses his relationship with his wife to control his pain. Then there is the dependent narcissistic guy who doesn't work, lives off his wife, and uses the alcohol to remain dependent and uses the violence to control his wife. In general, 8 out of the 10 clients who have problems with domestic violence have some problem with alcohol in their lives and at least 50 percent of the men I see have a substance abuse problem.

AH&RW: From your experience, can you draw any conclusions about the relationship between alcohol and battering?

GG: That's a complicated question. Let me explain the four-stage battering cycle and place the use of alcohol within that framework. The first stage is one of increasing tension, which leads to the explosion; the second stage is the explosion and the acting out of violence. In the third stage, there is a period of remorse and guilt: he apologizes and claims—and often sincerely believes—that he will never do it again. If she agrees to take him back, there ensues a period of hearts and flowers and, for a short time, everything is wonderful. Because neither person has dealt with the conflict, this leads to the inevitable period of increasing tension. It is during this period of increasing tension that the batterer—and sometimes his wife as well—starts to drink more heavily. Partly, I think, to control the tension, stress, and pain. And, of course, the alcohol finally gives him permission to act out his rage. He can say, "Well, I was drunk. I didn't mean it." Or he can claim that he had a

> and build the relationship. . . . Such methods, however, should be used judiciously in treatment. (p. 114)

Neidig and coworkers explain that the philosophy of DCCP services is based on the view that "violence is primarily a function of specific skill deficits on the part of the couple." As a result, the program focuses on helping both partners acquire new skills that will eliminate the violence and enhance communication. Neidig and coworkers (1985) believe that it is important to see both partners together: "Although seeing the couple together may inhibit full disclosure of details of violent history, this arrangement seems preferable to the increase in suspicion . . . which often follows individual sessions."

A View to the Future

Many who have worked with dually affected families agree that more steps are needed to facilitate networking among alcoholism counselors and those who serve families suffering from domestic violence. Lehmann and Krupp (1984*a*) conclude:

> There is a definite need for more information, awareness, training, cross-fertilization, and development of referral networks for practitioners in the domestic violence and alcoholism fields. (p. 27)

Sanchez-Dirks (1979) noted that training programs to help domestic violence workers identify and handle alcohol problems among their clients as well as programs to train alcoholism counselors to recognize family violence were essential to control both types of abuse. Lehmann and Krupp (1984*b*) have proposed a three-component program designed to address the needs of dually affected families and those who serve them. By providing support and referral services to abusers and victims—of both alcohol and violence, by training professionals, and by developing referral networks, they say, some of the fragmentation can be alleviated.

Flanzer (1984) offers the following suggestions to those who counsel dually affected families:

- Recognize the intermingling of domestic violence and problem drinking by asking clients about their drinking and violent behavior—"when, where, and how much."
- Do not tolerate either problem drinking or violent behavior: "The family is looking for someone to temporarily take control."
- Help family members assume responsibility for their behavior and to be accountable to one another: "To do so . . . is to encourage similar strength . . . of other family members." ☐

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blackout and can't remember the violence.

While I consider battering a symptom of second-stage alcoholism, I don't think that alcoholism causes the violence, nor do I think that if the alcoholism is cured, the violence will cease. There are batterers who don't drink and who may use other excuses to lose control. And, we have several people in our program who have been sober for years and have become violent while sober.

AH&RW: What would you say causes men to batter their wives?
GG: Again, I want to answer the question in two parts. First, I think men are brought up to be isolated, in control of themselves, and not to express or acknowledge fear. When they are threatened, they almost always resort to anger first, because anger is a powerful feeling and men want to feel powerful. Frequently men who are abusers come from families where their fathers were powerful, controlling men. So these men learn that they must be in control at all times. They see their relationships with women as a link to their own emotions. When there is conflict and the woman retreats, the man feels isolated and hurt. He becomes violent to protect himself from the pain.

The other part is that men have learned to use violence to express anger in order to control other people. Violence serves two purposes. One is to deal with their own pain; the other is to control the woman, to make her stop saying "no," to make her do what he wants.

AH&RW: What do you see as the chief goal of the program's services?
GG: As I see it, the goal is for men to assume responsibility for their violence and to learn to be whole people. They are learning to control the violence and learning to express feelings appropriately.

AH&RW: Is one of the goals of treatment in the program to keep the family together?
GG: As an organization, we don't take a position on that question. I think we try to look at things on a case-by-case basis. My own clinical feeling is that there are some relationships in which both people are so toxic to each other that we try to confront both people with the reality of their relationship. Sometimes after a man has not been violent for a while, he begins to see that this relationship is destructive to him. Or, perhaps, the wife won't forgive her husband for the violence he has perpetrated and she leaves. Or, she may realize after he hasn't been violent for awhile that she still doesn't like him.

We don't take the position that every time there is violence, the relationship should end. If we did that, we would get into trouble, because a good number of these men and women want to stay together and do stay together.

AH&RW: Do you find a correlation between spouse abuse and child abuse?
GG: Let me answer that question in two parts. First, we are conducting a research

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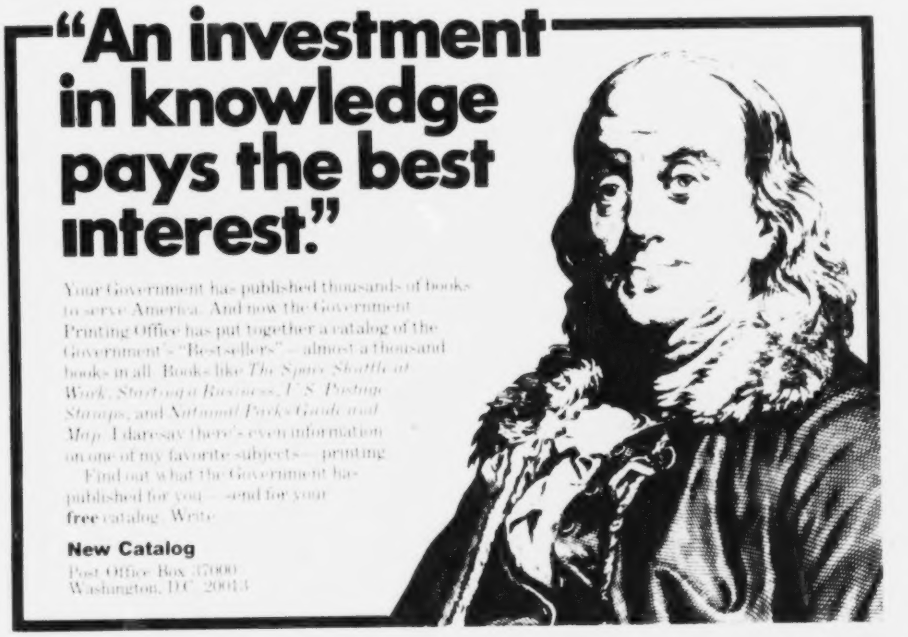
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project wherein we are looking at our clients' upbringing and we find that a fair percentage of the men were abused either sexually or physically while they were growing up. Second, we certainly do see some people who have already had their children removed from the home because of abuse or neglect. In the extreme cases, both husband and wife have abused the children. My hunch is that we are not hearing about a lot of it. In the court-ordered program, the men certainly don't want to talk about any additional problems.

AH&RW: Do you coordinate services with other treatment programs and agencies like AA or safehouses?

GG: We are trying to build bridges with AA. I really recommend it to our clients because AA can provide structure for peoples' lives.

We are also trying to build functional working relationships with each of the shelters in the area. We are members of the Colorado Council for Domestic Violence. We have learned that we have to be in contact with all the other people who do work in this area and that we can't afford to be competitive. One of the things we would like to see happen—and this is controversial—is to have the woman in some kind of supportive group at the shelter while the man is in therapy. Occasionally we would conduct couples sessions. This would only happen if we were certain the violence had stopped and the wife was not in any danger. We shy away from marital counseling because it very often doesn't work.

AH&RW: Does AMEND support or sponsor any long-term support groups for men who have a history of violence?

GG: Yes. Currently we have an AMEND network that consists of men who have completed long-term therapy and are now meeting on their own. They sponsor a series of activities in addition to support-group meetings. We refer people to those groups when we think they are ready.

AH&RW: How do you know when a batterer is "cured"?

GG: First, we encourage men to acknowledge that they have a problem with violence and that they run the risk of regressing and becoming violent again unless they maintain some kind of program. But we do see changes in people, especially if they have been in therapy for a couple of years. The client becomes very aware of his feelings and becomes assertive about those feelings. He learns to use the "time out" tool to control his anger. He can now talk about problems rather than controlling his wife during conflict; he no longer blames his wife for his anger. If he is responding in all these ways, has been violence-free for a couple of years, I think you can say that person has matured and is a good bet not to become violent again. ☐

—Arleen Rogan

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Alcohol, Spirituality, and Recovery

Thomas Prugh

The connections between the use of alcoholic beverages and the various aspects of religion are diverse and ancient. Religious leaders, organizations, and writers representing many faiths have long recognized the prominence of alcohol in human affairs, and they have both commented on and tried to influence the manner of its use.

The Old and New Testaments contain dozens of anecdotes and admonitions about drinking, from the account of Christ changing water into wine at the marriage feast in Cana (John 2:9) to cautions such as "Woe unto them that rise up early in the morning, that they may follow strong drink; that continue until night, till wine inflame them" (Isaiah 5:11).

Royce (1985) notes that Islam and Hinduism address themselves to alcohol use by taking a prohibitionist stance. He also observes, however, that ancient Babylonian texts depict the use of alcohol in religious ceremonies. This evidence (from 6000 B.C.) is only one early example of the ritual use of alcohol, a practice that has been followed in various forms by Aztecs, Jews, Shintoists, Greeks, Romans, the Kofyar of Nigeria, Roman Catholics, Anglicans, Episcopalians, Lutherans, and members of the Greek and Russian Orthodox faiths. The connection between alcohol and religious faith is also made in so-called primitive cultures where religion is less structured and institutionalized. Horton (cited in Clinebell 1981) writes that primitive peoples often consider wine a direct gift of the gods.

But if church organizations have sometimes incorporated alcohol in religious practices, they also have opposed its misuse and have historically devoted much time and attention to the resulting problems. In the United States, church groups and leaders were heavily instrumental in promoting the temperance movement and the passage of national Prohibition (Conley and Sorensen 1971). This legacy remains in sects that urge their members to abstain from alcohol consumption. Other denominations that do not make this requirement also exhibit substantial concern about alcohol problems. This interest has led to the creation of many organizations that address alcohol abuse and its consequences among church members, the clergy, and the population at large, including the National Catholic Clergy Council, the North Conway Institute, and the Ecumenical Council on Alcohol Problems (Hancock 1982). Most recently, the Presbyterian General Assembly has created a Task Force on Social and Health Effects of Alcohol Use and Abuse to study marketing patterns, tax policy, beverage alcohol export, advertising, and related social policy issues.

The ceremonial or symbolic use of alcohol and the social activism of churches with respect to alcohol problems are the two most obvious ways alcohol and religion are linked. There is a third connection, however. For some, it is the most important and fundamental of all: drinking as a means of trying to approach or realize the divine. Probably the most famous testament to this effect was voiced by the American psychologist, William James. In a series of lectures delivered at the University of Edinburgh in 1901 and later published as "The Varieties of Religious Experience" (1961), James said:

> The sway of alcohol over mankind is unquestionably due to its power to stimulate the mystical faculties of human nature, usually crushed to earth by the cold facts and dry criticisms of the sober hour. Sobriety diminishes, discriminates, and says no; drunkenness expands, unites, and says yes. . . . It makes the drinker for the moment one with truth. . . . The drunken consciousness is one bit of the mystic consciousness. [pp. 304, 305]

Others also have alluded to the attempt to achieve transcendence by drinking. Some Native American tribes have used alcohol as an adjunct in the traditional practice of vision questing (Collins, cited in Trimble 1984). The German philosopher Friedrich Nietzche (cited in Clinebell 1981) argued thus: "Under the charm of the Dionysian . . . Nature which has become estranged, hostile or subjugated, celebrates once more her reconciliation with her prodigal, man."

Clinebell (1981) speaks of the ability of alcohol to induce a temporary experience of the "vertical dimension of life" and also mentions a passage in Thomas Wolfe's novel "Look Homeward, Angel": "Why, when it was possible to buy God in a bottle, and drink him off, and become God himself, were not men forever drunken?" A striking echo of this sentiment is found in a belief of Bill W., one of the cofounders of Alcoholics Anonymous: "Before AA we were trying to find God in the bottle" (Clinebell 1981).

Interest in the possible relationship between alcohol use and spirituality seems to be on the rise. Anecdotal evidence suggests that more and more alcoholics and

Charles L. Whitfield: "The active alcoholic is trying to celebrate God through alcohol, and it's not working, not very well."

helping professionals believe it is important to address spiritual hungers and issues in counseling alcoholic clients and in promoting their continued growth and recovery. A widening stream of magazine articles and books has appeared—including Andrew Weil's "The Natural Mind" (1973), Jacquelyn Small's "Transformers: The Therapists of the Future" (1982), and Charles Whitfield's "Alcoholism, Other Drug Problems, and Spirituality" (1985)—that speak directly to the use and misuse of alcohol and other chemicals as means of achieving transcendent states of consciousness. Conferences and meetings of alcoholism professionals increasingly incorporate sessions on spirituality in their agendas. One chemical dependency treatment and education organization in Minnesota, Hazelden, recently broke new ground by establishing a Renewal Center especially for the spiritual development of recovering alcoholics and their families.

Many observers argue that there has been a general reawakening to religious and spiritual concerns in the United States. It is possible that the alcohol field is simply reflecting a kind of spillover, as people investigate the ways spirituality might affect all aspects of life.

But some believe there is more to it. "Alcoholism attacks the whole man and is a spiritual disease," writes Father Leo Booth (1984), a lecturer on alcohol problems. Recovery is seen as more than sobriety. For many alcoholics, the establishment of sobriety is only the first stone in the foundation required to build a meaningful life. Other stones must be laid through the continued pursuit of meaning and growth, especially in the spiritual dimension.

To explore these issues in more depth, *AH&RW* spoke separately with two professionals who are deeply involved in the effort to raise awareness of a relationship linking alcohol, recovery, and spirituality: Jerome Dollard, Ph.D., an ordained minister and Director of the Renewal Center at Hazelden in Center City, MN; and Charles L. Whitfield, M.D., Medical Director of the Resource Group in Baltimore, MD, and Clinical Associate Professor of Medicine and Family Medicine at the University of Maryland School of Medicine in Baltimore. For clarity, the excerpts below have been edited and blended.

AH&RW: What is spirituality?
CW: Spirituality is really a vast area, so vast that all we can do is scratch the surface. It's about relationships—with self, others, and the universe. It has to do with things like trusting, forgiveness, and zest for living. It has to do with meaning and purpose in life, and with getting free of suffering. It's the whole ball game, everything. In one sense, there is nothing we can do that is not spiritual.
JD: Spirituality is a lot like health—it is not something we can go out and buy, although a lot of people have tried that. We all have health; we may have good health or poor health, but it's something we can't avoid having. The same thing is true of spirituality: every human being is a spiritual being. The question is whether the spirituality we have is the negative one that leads to isolation and self-destruction or the one that is more positive and life giving.

AH&RW: What are the component parts of that spirituality?
JD: They reside in our capacity to move in the direction either of fear or of trust. I think fear is at the foundation of negative spirituality, and from the fear comes self-pity and resentment. On the positive side, we have the capacity to move in the direction of gratitude and acceptance.

AH&RW: Someone's upbringing could obviously affect, even cripple, his or her ability to experience trust. How do you deal with this issue in an alcoholic who may be trying to cope with a lifetime of negative experiences?
JD: These are not absolutes. I don't think we run into people who have a totally negative spirituality—nor, on the other hand, do we run into the perfect individual. It's more a question of what direction we're moving in. Even for somebody who's been raised in an alcoholic household and has been abused as a child, it is possible that they can meet people in an environment in which they begin to experience care, and within that environment of care it is possible for them to then respond with trust. I don't think the capacity is destroyed.

CW: The adult COA [children of alcoholics] movement is beginning to address the whole issue of recovery and spirituality in a more expanded dimension. Most of the literature and conferences in this area are on the recognition of children of alcoholics and on the mental-emotional area of recovery. This is beginning to form a firm base upon which further work in the spiritual realm will be possible. Luckily for us all, we have the Twelve Steps, as well as other spiritual principles, to guide us.

AH&RW: There must be clients whose experiences have been so overwhelmingly negative that they automatically tend to discount every care-giving gesture. What do you do then?

JD: You keep caring. You can't cross over that line and bring them out of it, but you can keep caring.

AH&RW: Is the tendency to "look for God in a bottle" a driving force for many alcoholics?

CW: I think it's major. The active alcoholic is trying to celebrate God though alcohol, and it's not working, not very well.

JD: I think there's an element of idolatry, in that the bottle becomes an all-consuming interest. All of your efforts are given over to a preoccupation with drinking, to "how can I get more" and "do I have enough?" It really becomes an enslavement. The bottle or the drug becomes God.

AH&RW: The kind of relationship you've described seems pretty childish, as though the person believes "God is there to give me what I want."

CW: "A Course in Miracles" talks about a very powerful concept: the "special relationship", which is any relationship that does not include God. A special relationship is one that you expect is going to satisfy you. It could be with a girlfriend, a boyfriend, a child, a car, a drug, alcohol, a job, a home . . . anything. You expect that they will make you happy—and of course, they never do. There's no special relationship ultimately that makes anyone happy, because there's only one relationship. The ultimate relationship is to settle our peace with and surrender to the higher power. An actively drinking alcoholic gets further and further away from God, in that special relationship with alcohol. The answer, the way out, is through what "A Course in Miracles" calls a Holy relationship, one in which the higher power or God is included.

JD: There's a danger that the bottle or drug can become God, in that there's such an addiction to it—whereas a relationship with God becomes free, enables a person to mature, to become more responsible. That is the real relationship with God, one that leads you *out* of self rather than into being more self-centered. The "Big Book" [of Alcoholics Anonymous] says that the alcoholic ends up in extreme self-centered fear. You didn't start out to do it that way. It wasn't what you were looking for. But that's what you end up with. The alcoholic is seduced by what is originally a very powerful experience of release, of completion, that ends in destruction.

CW: Every one of the major life issues we have with ourselves and with others—for example, feelings of abandonment, emptiness, trust, dependence/independence, control, giving and receiving love—we also have ultimately with the higher power. So all the stuff we're working on with parents and with loved ones and even with our enemies, we're also working on—hopefully—with God.

AH&RW: William James talks about simple spiritual experiences that happen all the time to ordinary people, such as hearing certain words or musical sounds, or seeing landscapes or ocean views, that have a strangely moving power or sense of deepened significance that is hard to explain. Do you address those experiences with your clients?

JD: Yes. One of the things I encourage people to do is to talk about their spiritual experiences, to be able to identify them, to name them, and to understand that it doesn't make them crazy.

AH&RW: Hearing other people talk about their experiences helps open you up to your own?

JD: Exactly. I think it's very important. I find, in AA, that as you listen to someone's "drunkalogue" and the story of their recovery, as you understand them, you also come to understand yourself. St. Francis said, "It is better to understand than to be understood," and that's really true.

AH&RW: James also argues that the capacity for spiritual depth and understanding probably varies enormously from one human being to the next. How do you approach and encourage your clients in whom that spiritual capacity or hunger for development may not be as strong as in others?

CW: In many ways. You can be a model for them. That's one of the great powers of counselors or therapists: they are models of spirituality themselves. They can live good lives that are moving in the direction of celebrating God; if you live it, it's more credible. The second point is that whenever it comes up in therapy and is appropriate, you can describe an event in spiritual terms.

So in our therapy groups, if somebody is talking about having a crisis—they've had a drunk driving arrest, or their spouse has left, or whatever—I reframe that as being a great spiritual opportunity for them to grow and to learn more about themselves. I may not mention spirituality for several group meetings, or I may mention it two or three times in one group—whatever I feel is appropriate for where they are in their recovery. But since alcoholism is a physical-mental-spiritual disease, and it's so crucial that they get the spiritual part of it for recovery, then I think it's worthwhile pointing it out to them.

JD: For all of us it's important to remember to keep it simple, and that experience is not the name of the game. Spiritual experience is really for the sake of the transformation of life, and is not to be sought simply for the sake of the experience. In "Twelve Steps and Twelve Traditions" Bill Wilson says: "There is a direct linkage among self-examination, meditation, and prayer. Taken separately, these practices can bring much relief and benefit. But when they are logically related and interwoven, the result is an unshakable foundation for life." So AA's sense of limitation in people—progress, not perfection; continued self-examination—reminds you that the person who's had an experience of some sort is also the one who is still wrestling with the resentment and still putting something off.

AH&RW: But getting involved in a difficult regimen of self-examination, devotion to others, prayer, and so on must seem like a pale substitute to any drinker who thinks he or she has made some sort of connection with the divine through alcohol. Don't many of them ask "Where's the payoff?"

JD: I think the payoff is being sober. See, the problem with the alcoholic is, granted you've been looking for God in the bottle, and granted you've had a lot of really neat experiences, but you've also been through

Alcoholism, Growth, and Potential

According to Dr. Howard Clinebell, Professor of Pastoral Counseling at the School of Theology at Claremont, CA, religion relates to mental health in one of three ways (Clinebell 1981): Pathogenic (sickness-causing) religion leads to fear, guilt, distrust, and stagnation; salugenic (health-giving) religion promotes trust, love, and personal growth; religion may also be irrelevant, simply playing no real part in resolving personal problems or pursuing growth goals.

Clinebell argues that many alcoholics who use alcohol in a pathogenic way are attempting to satisfy spiritual needs. He believes that, for many alcoholics, recovery must involve the replacement of these destructive practices with positive ones that can satisfy 10 "inescapable" needs—needs every human being has regardless of whether one's orientation is secular or religious:

1) Regular renewal of basic trust—the sense of belonging in the world;

2) Sound values to support and guide relationships and a meaningful life philosophy;

3) Relationship with and commitment to an integrating object of devotion—a central value in one's system of values, a "higher power";

4) Regular energizing experiences of transcendence—the experience of the "vertical dimension," peak experiences;

5) Reconciliation and forgiveness;

6) Regular renewal of self-acceptance and self-esteem;

7) Renewal of realistic hope and a sense of future possibilities—promoting the value of constructive living in the present while planning responsibly for the future;

8) Development of the "higher self"—what religious traditions often call the soul;

9) Nurturing interaction with nature and other people; and

10) Participation in a community with shared spiritual values.

Clinebell argues that while many factors contribute to addictions, unresolved issues of growth are crucial. He sees alcoholism and other addictions primarily as the result of "unlived life," of radically unfulfilled potentials. The less one is living up to one's potential, the more vulnerable one is to the ravages of chemical dependency.

His experience, Clinebell writes, has convinced him that "those [alcoholics] who have achieved stable sobriety have been those who have begun growing again, often after many years of blocked growth caused by the downward spiral of addiction." Further, "spiritual growth is at the center of all human growth because this dimension has to do with those aspects which make human beings unique in the animal kingdom." This growth is one of the chief functions of constructive religion—religion that "aims at liberation," that has to do with "the truths which free persons to live closer to their full potentials."

—Thomas Prugh

Reference

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hell in a handbasket. You've ended up isolated, alone, fearful, and full of remorse and guilt and shame. Nobody wakes up one great morning and says, "Golly, everything in my life is going so well I think I'll stop drinking and join AA." The people who come to AA are people in just horrible pain. I think they have discovered, many of them, that the experience—as experience, in and of itself—doesn't last.

AH&RW: The literature on spiritual development often tries to explain things in terms of the Higher Self and the Ground of Being and so on—concepts that are very abstract and difficult to connect to your own life. How do you surmount that challenge?

CW: It usually takes from one to a few years, depending on the person and the treatment or recovery program, to begin to understand these conceptions at a deep or experiential level. The counselor, therapist, or sponsor addresses that both by example and by counseling. Those helpers who understand these concepts and can use them in their helping may be more effective.

JD: We do it here at the Renewal Center through the Twelve Steps. Basically the Twelve Steps have one promise, the promise of a spiritual awakening. They can be as deep as you want them to be.

AH&RW: Isn't there a conflict between promising a spiritual awakening and the idea that you don't do the Steps just to seek such an experience?

JD: I'll make a distinction here, and I think AA does, too—it's one of the few changes that occurred in the "Big Book." The first edition referred to "having had a spiritual experience as a result of these Steps"—and many people in AA felt like, "Gee, I've worked these Twelve Steps and I haven't had my spiritual experience. Where is it?" Or they did have a spiritual experience, and thought that was all they needed, and they got drunk again. I think that was when AA decided to change the wording from "spiritual experience" to "spiritual awakening." Awakening had more of a connotation of an ongoing process, and more of a sense of insight gained and integrated, rather than having had a peak experience which one could then live off of the rest of one's life.

The experience must be received and integrated into one's life. We tend to hear about the success stories, but we don't know what may have happened to people who've had very significant and moving experiences but have not been able to integrate them, or have refused to, or have sought them for selfish ends—you know, like "more, more, more." Bill W. had one, but he still needed to hang on to that, to live it out. He spent the first 6 months trying to tell everybody about this wonderful spiritual experience that had delivered him. It wasn't until after 6 months that he finally figured out it wasn't working, because nobody else was staying sober but him. He *did* stay sober, because of that experience and trying to share it, but eventually he figured out that he needed to

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Statistics in Research Reports

A Reader's Guide

Dorothy T. Moore, Ph.D.

Editor's Note: *The following article is the third in our three-part series on statistics for research consumers. The first two articles appeared in the Spring 1985 and Summer 1985 issues of* Alcohol Health and Research World. *In the first article, the author explained the role of statistics in scientific research and reviewed some basic concepts. Surveys and nonexperimental clinical studies were discussed in the second article. If you missed either of these articles and would like a copy, please address your request to the author, c/o National Clearinghouse for Alcohol Information, P.O. Box 2345, Rockville, MD 20852.*

The two research areas that have yet to be discussed in this series are *experimentation* and *evaluation*. Such a combination may seem strange, because experimentation is the heart of scientific research whereas evaluation usually serves as the eyes and ears of prevention and treatment programs. However, the apparent differences are used in this article to sharpen our understanding of each of these research areas and of the appropriate statistical methods. The article concludes with a brief summary of the principles common to all types of research.

Experimentation

All of us are experimenters, in an informal sense. Depending on what arouses active curiosity and a desire to obtain results, one person will experiment in the kitchen with new recipes, another will try different routes for driving to work, and yet others will test different strategies for opening a chess game, closing a business deal, playing a trill on a violin, memorizing the names of the cranial nerves, painting the front porch, planting a garden, or engaging in any other activity that is appealing and/or important. We may want to know how something works or how to make it work better. In any case, we understand intuitively what "experimentation" means, whether or not we call it that.

Whatever the context, experimentation is *doing*. Therefore, it is empirical, i.e., makes use of experience. Through experimentation, we obtain empirical evidence for the statements we make about issues that interest us. As a scientific program, experimentation also means *going*—moving toward new knowledge of nature. Therefore, it is often heuristic, i.e., causes new questions to be raised as old ones are being answered. Scientists disagree as to whether all questions in any research area can ever be completely answered, but they do agree that without experimentation, the road they travel would be obscured—as it was before the scientific revolution—by a cloud of speculation and superstition.

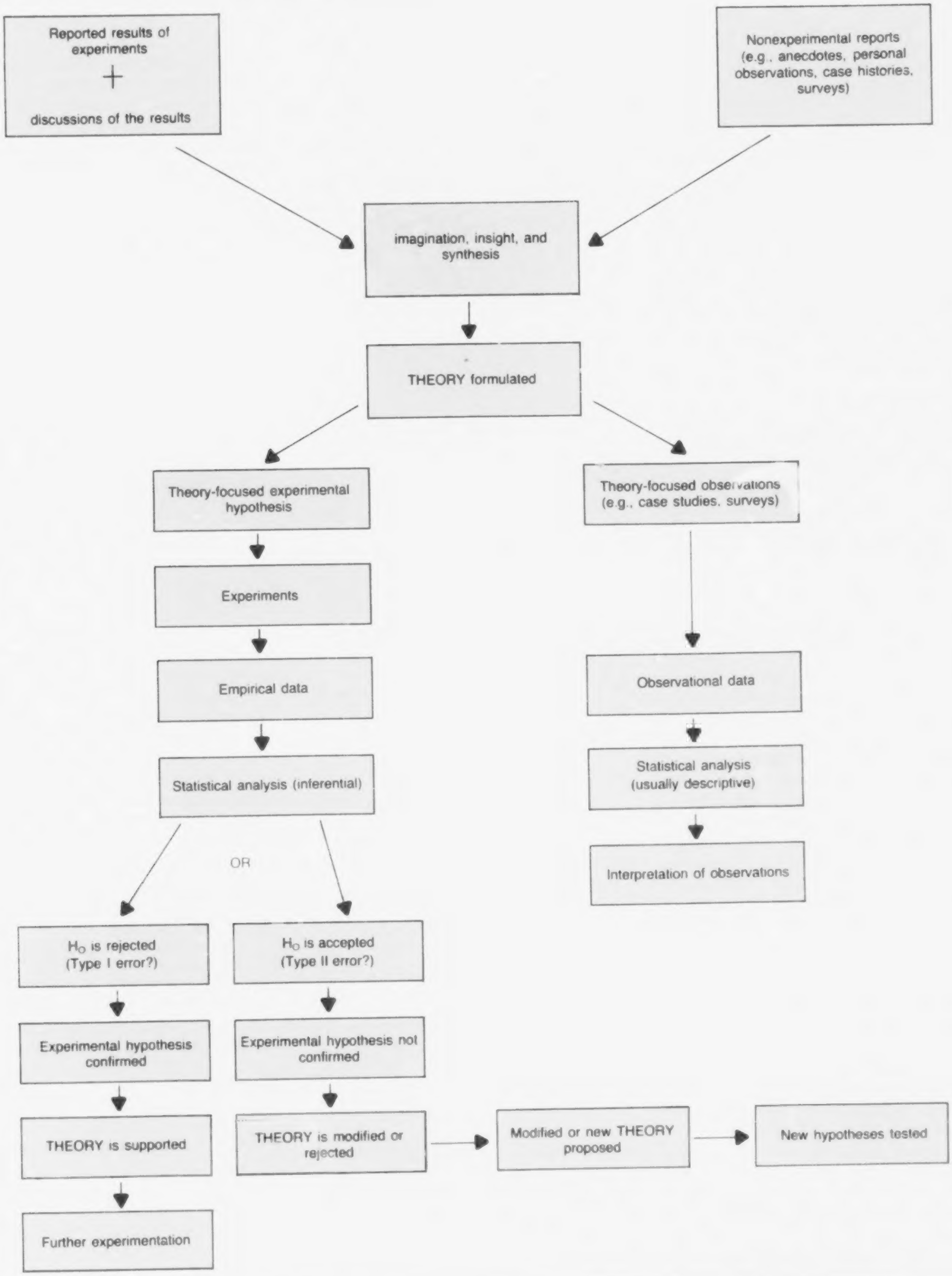
Scholarship. Experimenters like to describe well-designed research as "elegant," much as an engineer might describe a beautiful machine. Unlike an automobile, though, an experiment can't be superbly constructed without specifying where it must go and why. The "why" of the project directly shapes the "how" of its design. The first phase of laboratory research, then, is scholarly research. This lays the foundation for planning experiments and also for explaining them to others. These "others" are a wide variety of audiences, including boards that review grant proposals, fellow scientists, reporters who cover science news, officials responsible for public policy, authors of textbooks, and individuals who read the research reports. Thus, scholarship is an essential part of a scientist's accountability.

Scholarship also can serve a creative function: the generation of ideas for new research. But scholarship without curiosity is dead, and curiosity without imagination is impotent. The combination of curiosity and imagination that sets research in motion can be applied to both scholarly knowledge and everyday observations. As any amateur experimenter knows, an idea for research can come from virtually any event—an apple falling to the ground, a dog salivating, flashes of lightning, even the twitch of a frog's leg. In the context of alcohol research, survey results and clinical reports spark new experimental research as well.

Most scientists abhor a theoretical vacuum. Traditionally, experimental research is designed to test and improve theories. Here, too, scholarship performs an important function: to provide perspective. Equipped with knowledge of the related literature and familiarity with the ongoing research of colleagues, a scientist typically develops a theoretical position and plans experiments around it, not so much to defend it as to test its validity and its power.

Hypotheses. Like Heracles, a scientific theory faces a series of unpredictable but unavoidable challenges. The empirical proof of a theory, like the labors of Heracles, is a test of both strength and in-

Figure 1. Schematic outline of theory-testing processes.


Reported results of experiments
+
discussions of the results
Nonexperimental reports (e.g., anecdotes, personal observations, case histories, surveys)
imagination, insight, and synthesis
THEORY formulated
Theory-focused experimental hypothesis
Theory-focused observations (e.g., case studies, surveys)
Experiments
Empirical data
Observational data
Statistical analysis (inferential)
Statistical analysis (usually descriptive)
Interpretation of observations
OR
H₀ is rejected (Type I error?)
H₀ is accepted (Type II error?)
Experimental hypothesis confirmed
Experimental hypothesis not confirmed
THEORY is supported
THEORY is modified or rejected
Modified or new THEORY proposed
New hypotheses tested
Further experimentation

genuity. (Recall that the other sense of "proof"—establishing that a theory is absolutely correct and permanently true—is inappropriate in empirical research on biological and social issues.) Hypotheses derived from the theory provide the means for testing it. When an experimental hypothesis is confirmed, the results support the theory.

Another kind of hypothesis, the *null hypothesis* (H_o) provides the means for applying statistical tests to the experimental results. The calculations are directed toward accepting or rejecting H_o. If H_o is statistically acceptable, this disconfirms the experimental hypothesis. If H_o is statistically rejected, this confirms the experimental hypothesis. Does this sound contradictory to anyone? To most students, at their first exposure to the methods, it certainly does. To clarify the procedure, Figure 1 shows not only the key elements but also other important points.

The most important point to bear in mind is that the null hypothesis is a convention, a sort of "dummy" concept for the purpose of putting into operation the laws of probability. It says, in effect, "This is the way things would have turned out if there had been no experimental manipulation, if the results had occurred by chance." Thus, "null" means "no manipulation" and "by chance" refers to the probability that such-and-such would have happened.

On the left side of Figure 1, statistical analysis is shown as the operation that separates theory confirmation from theory rejection, by the conventional device of testing the null hypothesis. Calling this analysis *inferential* is one way to acknowledge that we are making inferences (i.e., educated guesses) only, not describing absolute proofs. Given the recorded experimental data, we infer that these events happened because some aspect of the tested theory probably is true. The experimental hypothesis, then, functions as a bet based on a hunch. It amounts to saying, "I'll bet such-and-such will happen if we do thus-and-so." More about this later.

For now, consider again the sequences following statistical analysis of the empirical data. If the null hypothesis is rejected, this means that the probability level (the alpha level) adopted in advance has not been achieved. For example, if this level is .05, and the inferential test tells us that $p \leq .09$, the results could have occurred 9 percent of the time by chance, when we had set the criterion at 5 percent. The 9 percent is too large to satisfy the criterion.

As noted in Figure 1, rejecting H_o could mean that a Type I statistical error has occurred, and accepting H_o could mean that a Type II error has occurred. Since rejection of H_o means confirmation of the experimental hypothesis, enabling us to say that the results are *significant* at the given alpha level, the Type I error means that we've claimed success when, in fact, the data are not all that positive.

On the other hand, the Type II error is a possibility whenever H_o is accepted and the experimental hypothesis is disconfirmed. This can occur when the data appear, statistically, to represent negative results.

None of this is as certain as everyone could wish. Uncertainty is an unavoidable aspect of scientific research. How to minimize it? First, by recognizing that it exists. Then, to set a sufficiently tough criterion (e.g., an alpha level of .01 rather than .05). Finally, to use inferential tests that reduce the amount of uncertainty. A statistical test that reduces the likelihood of a Type I error is said to have *rigor*. A test that reduces the likelihood of a Type II error is said to have *power*. A rigorous test reduces the risk of false optimism about the experimental results. A powerful test reduces the risk of discarding a potentially promising and fruitful idea.

Researchers have at their disposal a large repertoire of inferential tests. These can be divided into two broad classes, *parametric* and nonparametric. This distinction, obviously, is based on the concept of parameters. Recall that parameters for a whole population are comparable to statistics for a sample of that population. Hence, for a population, the standard deviation is a parameter signified by the Greek letter sigma, σ. For a sample, the standard deviation is a statistic signified by an s.

Parametric tests are the ones we use when we are fairly certain that the population is normally distributed and that the sample statistics closely approximate the population parameters. For example, if there is good reason to believe that the mean and the variance for the sample have values very close to the mean and the variance for that sample's population, we use a parametric type of statistical test. Table 1 lists some of the most widely used tests in each category.

The distinction between these types of tests is an extremely important conceptual principle in statistics. It is also a pragmatic principle of prime importance. Using too powerful a test means improving the chance to obtain significant results, but the Type I error may have been committed. If so, the experimental hypothesis is unjustifiably confirmed. On the other hand, use of a test that is too rigorous can lead to rejection of an idea worth pursuing.

Much confusion is evident in the attempts of most students—and even some published researchers—to make use of the appropriate inferential tests. The main problem seems to be a tendency to equate "power" with "rigor." For this reason, there is a widespread mistaken assumption that parametric tests are somehow more virtuous than nonparametrics. In such a case, we may find a *t* test used when it

Table 1. Statistical tests widely used in experimental reports.

Parametric Tests	Nonparametric Tests
Student's *t* for a single sample	sign
Student's *t* for repeated measures or matched groups	Wilcoxon matched-pairs signed ranks
Student's *t* for independent groups	Mann-Whitney *U*
	Chi-square
	Kruskall-Wallis H
Analysis of variance (F test, also called ANOVA)—one-way and two-way	Friedman two-way analysis of variance by ranks
Tukey's honestly significant difference (HSD)	median
Newman-Keuls	Kolmogorov-Smirnoff
	Fisher's exact probability

would be better to use the Mann-Whitney *U* test.

What are the crucial differences? One important—and possibly misleading—difference is that calculations for nonparametric tests are usually so easy as to be virtually effortless. Perhaps anything that easy seems to lack virtue, in our culture. As a matter of fact, though, the nonparametrics are far more rigorous than the parametrics. If you get significant results using a nonparametric test, you are almost certain to get even more significant results using a parametric test. The relatively more rigorous nonparametric test minimizes the risk of a type I error.

Having an independent variable to manipulate implies that there is a *dependent variable* to measure. This simplest way to view this other essential variable is behaviorally: The dependent variable is the response of the subject. Another way to look at it is to refer to the recorded experimental data. These are based on the dependent variable. Finally, this type of variable depends on manipulation of the independent variable. The contingent relationship of these two variables is the key concept in experimentation. The fundamental assumption is that when the chosen variables covary, differences in the use of the independent variable have caused the observed differences in the dependent variable. For example, the breast milk of mothers who have ingested alcohol—but not the milk of mothers who have had no alcohol—will contain measurable traces of alcohol. In this case, it is easily inferred that alcohol consumption is what causes alcohol to appear in the mother's milk.

A word of caution is in order here, however. It is tempting to interpret one dependent variable in terms of another dependent variable. This endows a correlational relationship with the status of a causal relationship. We may be able to say, for example, that when the blood alcohol concentration (BAC) is high, the drinker walks unsteadily. But BAC and steadiness of gait are two different dependent variables. To infer that a rise in BAC is the cause of unsteadiness is no more valid than to say that unsteadiness causes a rise in BAC. Both are caused, somehow, by ingestion of alcohol, the independent variable; but one dependent variable can't sufficiently explain another.

In alcohol research, many causal relations remain to be discovered. Every scientific endeavor passes through a descriptive stage of gathering evidence and making connections before it matures, finally offering genuine explanations. Thus far, we have more descriptions than explanations. We know that high blood pressure is associated with heavy drinking, but we don't know why or how. We also know that some heavy drinkers never develop hypertension symptoms, but we don't know why. We know that there is a group of symptoms known as fetal alcohol syndrome (FAS) associated with maternal drinking during pregnancy. But we don't know why some offspring of drinking mothers escape this fate. We are not going to be able to answer the "why" questions until we know precisely how alcohol affects the body and interacts with genetically influenced individual differences. This will require experimental research linking particular dependent variables, one by one, with the appropriate independent variables.

Returning to the examples of experimental hypotheses proposed above, what are the reasonable choices for dependent variables? Ideally, they should be quantifiable. Two basic requirements make this possible: (1) valid techniques for observing what the subjects are doing and (2) numerical values for the observed responses.

In the current state of alcohol-related research, the dependent variables for the first two one-tailed hypotheses would probably be the frequency of fetal alcohol effects observed in the mouse litters. The third hypothesis in this group calls for measurement of testosterone levels in the blood and other body fluids.

As for the proposed two-tailed hypotheses, the choices of dependent variables show how widely "responses" of the subject can be interpreted. For the first one, it would be appropriate to measure levels of several hormones—female and male—in the female monkeys. (Note that this experiment would be confounded by individual differences in female hormone cycling if these weren't controlled for by using subjects that are all in the same phase of the ovulation cycle.) For the second two-tailed hypothesis, the children's IQ scores will serve as the dependent variable. Finally, in the third hypothetical study, the obvious dependent variable is duration of pregnancy, from conception to birth.

The dependent variable is the vital link between the experimental question and the empirical answers. The form it takes will determine not only the statistical operations required but also the usefulness of the research results. Such practical concerns are encountered in everyday life. For example, how far apart are Charleston and Lewisburg in West Virginia? In this mountainous State, the practical measure is travel time, not the number of miles. In many areas of alcohol research, such clear and meaningful distinctions have yet to be established.

The choice of independent variable determines the treatment of both the experimental and the control subjects. A general rule of experimental design is to manipulate only one independent variable. If more than one is manipulated, one of two things has happened: (1) The experiment has been confounded or (2) this is a complex experiment that can been taken apart and looked at as a combination of two or more simultaneous experiments. If the design has confounding variables in it (e.g., potentially important differences in sex or age or race in the alcoholic sample), it won't be possible to assess the effect of the intended independent variable. The point is that for each independent variable, there has to be a control condition.

Taking the one-tailed hypothesis examples above, the independent variables are (1) aspirin dose, (2) alcoholic diet, and (3) chronic alcohol abuse.

Control conditions for these independent variables would be, respectively, (1) neutral doses of a nonaspirin substance, (2) a nonalcoholic diet matching the caloric value of the alcohol diet, and (3) alcohol abstinence or a specified, limited consumption. In each case, two or more control groups could represent two or more different values of the independent variable. In the case of aspirin, for example, the experimenter could test the effects of three dose levels. Such variations in the chosen variable are commonly used in studies of drug effects on animals, to obtain data showing changes in response as a function of changes in dose. The resulting dose-response curve is useful in estimating amounts to specify for desired effects in other animal studies or even in human patients.

Now back to the subject of experimental hypothesis itself. Anatomically speaking, it can be one-tailed or two-tailed. This seemingly absurd distinction does make sense statistically, and the outcome of the experiment depends crucially on the difference. The *tail* concept in this context is derived from the picture of the normal curve: On the right and on the left, it dwindles to a tail-like shape. Thus, a one-tailed hypothesis places its bets in one tail or the other of the curve. It states that something definite, extremely plus or extremely minus, will happen in the experiment. This proposition will be tested at only one extreme of the curve. A two-tailed hypothesis, in contrast, merely predicts that a change will occur without specifying the direction in which this will happen.

Here are some examples of one-tailed hypotheses: (1) Dosing pregnant mice with aspirin will reduce the frequency of fetal alcohol effects in their offspring. (2) Male mice on a high-alcohol liquid diet will father malformed offspring. (3) A decrease in testosterone level will be associated with chronic alcohol abuse in men.

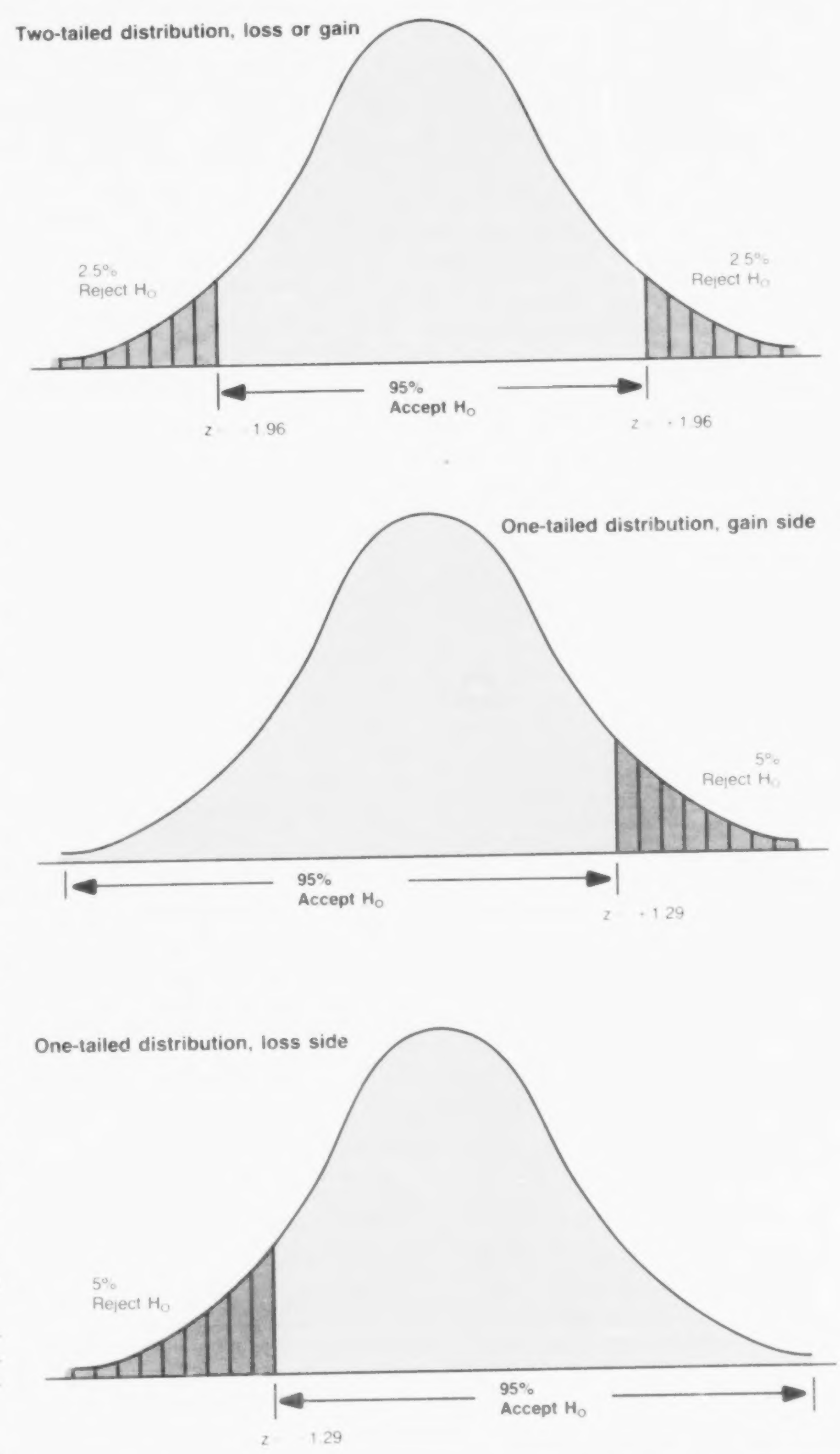
Here are some examples of two-tailed hypotheses: (1) A heavy, acute dose of alcohol will immediately affect sex hormone levels in a healthy female monkey. (2) The IQ of an FAS child will change over a 5-year period. (3) Alcohol consumption during pregnancy will change the gestation period for rats.

Statement of a hypothesis in a one-tailed version offers the experimenter a statistical advantage, because the one-tailed hypothesis tested at the alpha level of .05 is easier to confirm than a two-tailed hypothesis tested at the same level. This happens because the .05 (5 percent) region of the normal curve is split into two 2.5 percent regions when a two-tailed hypothesis is used. In the one-tail example, then, the area in which significant results are found is twice as large as the two-tailed area on that side of the curve. (This difference is schematically illustrated in Figure 2.) The researcher must keep in mind, however, that a one-tailed hypothesis goes out on a limb in only one direction. If, for example, aspirin dosing is followed by a significant increase in fetal alcohol symptoms in mice, the experimental results have disconfirmed the original hypothesis.

Essential to the construction of either kind of hypothesis statement is the choice of variables. The *independent variable* is the one that is, in some sense, manipulated by the experimenter. This manipulation may be direct, as in the case of administering aspirin to a mouse, or it may involve selecting a special clinical group to study, as in the case of testosterone levels of chronic alcoholics. The latter type of independent variable is a "natural" variable in that alcoholism is not produced by the experimenter.

Designs. Two general categories of research design are used in both experimentation and evaluation. Most frequently reported are studies using two or more groups of subjects. In a clinical setting, these are usually called *clinical trials*. In the other type of study, only one group of

Figure 2. Approximate normal curve distributions when alpha = .05.



subjects is used. In this case, instead of speaking of "groups" we speak of "conditions," so that all of the subjects receive the same variations in condition, i.e., treatment of the independent variable.

Between-groups studies. The most basic design of this type calls for comparison of data from one experimental group and one control group. The two groups need not be the same size unless they must be matched pairs. Ideally, the only significant difference between the groups is the treatment of the independent variable. In a clinical drug study, for example, the experimental group will be administered the drug and the control group will receive a placebo. The drug dose is the independent variable. Specified types of drug effects will serve as dependent variables.

In this article, with reference to potentially confounding variables, the concept of "control" has been defined as a standard by which to evaluate the data from the experimental group. Other aspects of control need clarification before a research design can be thoroughly critiqued. Let's take these one by one:

1. Individual differences must be acknowledged and controlled for. They cannot be completely eliminated. In the ideal between-groups study, the subjects are randomly chosen and, in a systematic way, randomly assigned to different groups. Thus, each group contains a random assortment of individual differences. Presumably, the effects of these differences cancel each other out if the groups are large enough and if they are random samples of a normally distributed population. Randomization, then, is the control for individual differences. It also eliminates unwanted bias in the selection process.

2. Matched pairs are sometimes studied in conjunction with an independent variable not literally manipulated by the experimenter. The testosterone levels of alcoholic subjects for example, may be compared with those of nonalcoholic subjects of similar age and physical constitution. In clinical research, a case-control study matches a group of patients with others who differ in clinical symptoms but are similar in potentially confounding factors.

3. Bias on the part of the experimenter is controlled for by "blind" procedures. In a drug study, the simplest single-blind design calls for administration of the drug by one person and measurement of its effects by another person. In the more rigorous double-blind design, the person who administers the drug and the placebo doesn't know which subjects receive which kind of dose *and* the person who observes the effects is not told which treatment each subject has received. The statistical descriptions of the results are worked out after the group assignments of the subjects have been revealed.

4. A single group can be studied in a between-groups design. In such a case, the control group is represented by standardized norms based on prior testing of large numbers of subjects. The "experimental" subjects may be a group of children diagnosed as showing fetal alcohol effects. If their IQ scores are compared with the norms for these tests, we have a between-groups comparison.

5. Except for histological, biochemical, and other types of laboratory bench studies, variations in environmental conditions are known to affect the outcome of an experiment. In a well-controlled study of living subjects, the place, the time, the lighting, the apparatus, and other ambient features of the experimental setting are kept the same for every subject. Weather changes and potentially distracting scenery are usually controlled for by conducting the research in a windowless room.

Within-group studies. Unfortunately, between-group research rarely incorporates all recommended controls. A useful alternative is a single-group design. When only one group of subjects is used, each subject serves as his or her own control. Here are some variants of this type of design:

1. Longitudinal research, a much-needed type of study in the alcohol field, follows the same subjects over an extended period of time. This is a particularly important concern where developmental questions have high priority. The research design may look more like a survey than an experiment, but as the data are collected, experimental types of statistical analysis can be applied. An opportune example is the followup research reported by Streissguth and her colleagues on a group of FAS children who were diagnosed at birth.

2. For the incomplete within-subjects design, all subjects are treated to all variations in the independent variable in the same order. This frequently occurs in research on alcohol and other drugs. Typically, the subjects receive a series of progressively increasing doses of the drug and are tested in a behavioral task at each dose level. Statistical analysis in such a case is restricted to within-subject data, comparing the effects of dose A with those of dose B with those of dose C, etc.

In general, the within-subjects type of design minimizes some control problems but increases the possibility of confounding the results in other ways. The most troublesome is the problem of order effects. In the incomplete within-subjects design, these are not controlled for. Something can happen in condition A that affects the way the subject perceives condition B, etc. In fact, this is a well-established finding in psychophysical testing of sensory perception. In addition, the incomplete design can't be used when either learning or fatigue in the early conditions will affect performance in the later conditions.

Complex designs. The solution to the problem of order, learning, and fatigue effects in a one-group study is to combine the between-groups and the within-subjects types into one complex experiment, a complete within-subjects design. Then in a study in which two dose levels of a drug are administered before behavioral testing, half the subjects would receive dose A first and dose B second; the other half would receive these in reverse order. This counterbalancing of dose order controls for both order effects and fatigue. No matter how many dose levels are studied, counterbalancing (called "block randomization" for studies of several conditions) provides the necessary control.

In the between-group category, complex experimental designs are needed in studying the interaction of independent variables and possibly of related dependent variables. The most popular is a relatively familiar design that is depicted in a four-square table, with two variables named across the top and two other variables named at the left side. In survey research, these tables are often called "crossbreaks." In experimental work, they are usually called two-by-two contingency tables. Such a table is familiar to anyone who has had elementary instruction in the genetics of sex determination, as shown in Table 2. Since it is assumed that the chromosomes determining sex are randomly assorted and that the mother and the father each contributes one chromosome to the 23rd pair in human genetics, there are four equally probable combinations of x and y.

Contemporary researchers tend to plan sequences of interrelated studies. The interpretation of one set of results provides a hypothesis to be tested in a succeeding study. Sometimes, however, it is more fruitful to investigate several variables in a single project, especially in the context of

Table 2. Two-by-two contingency table showing assortment of chromosomes (from pair 23) contributed by the mother and the father that determine the sex of the offspring.*

		Mother	
		Xm	X_f
Father	Xm	**XmXm** **25%**	**XmX_f** **25%**
	Y_f	**XmY_f** **25%**	**X_fY_f** **25%**

*X_m of each parent is inherited from that parent's mother. X_f of each is inherited from the parent's father. Y_f can be inherited only from the father's father.

biological issues that have important lifestyle implications. Table 3 shows one way to design a study of the interaction of an acute alcohol dose with cigarette smoking.

Each compartment in this design represents a group of subjects. The experiment could be further enriched by including subjects who will receive just enough alcohol to reach a BAC level of about 0.05. It could also be significantly improved by grouping the subjects by such variables as sex, age, and race. Such additions would, of course, increase the number of groups in the experiment.

Table 3. A design for studying smoking-alcohol dose interaction. Dependent variables would be such physiological measures as pulse rate and blood pressure.

	Peak BAC (%)	
	0.0	0.10
Heavy Smoker		
Light Smoker		
Non-Smoker		

In this design, the variables are fairly clearcut and quantitative, not really difficult to define. So a study of this kind is more compound than complex. That is, the results could be taken apart and treated like a set of simple experiments. They could be analyzed statistically by separate *t* tests. Statisticians warn us not to do this, however. They say that the results are more valid if the analysis is performed on the whole, assembled collection of data. In this case, analysis of variance (the F test) would be the test of choice.

Choosing the appropriate inferential test is one of the crucial decisions in statistical treatment of research results. Usually, this is the final one of a set of decisions that can make or break the value of the study. Some of the elements that go into making the best available decision are the answers to the following questions:

Number of groups? Type of groups: randomly independent groups or matched pairs? Number of subjects in each group? Number of independent variables being manipulated? How quantified? Number of dependent variables? How quantified? Alpha level? One- or two-tailed hypothesis?

In today's mechanized world, an additional question about computer hardware and software is appropriate: What machinery is available for data analysis?

Evaluations

Computers, those speedy assistants with programed intelligence, are credited with having spurred the growth of evaluation as both science and technique. As a science, evaluation research resembles experimentation: It proposes theories and tests the theory-related hypotheses. As a technique, it applies research results to the assessment of programs.

The practical, applied aspects of evaluation are the main concern in this article. Treating program evaluation itself as a form of research, we look at the program as a set of variables and results.

From this viewpoint, the prevention or treatment program is like a complex experiment in which several independent variables are manipulated and the dependent variables are the outcomes.

The program development process usually begins with a statement of a problem. When possible, this is a quantified statement. If broad enough in significance, the dimensions of the problem have been measured by carrying out a survey. Descriptive statistics based on the survey results help to formulate the goals of the project and quantify the stated objectives. This statistical backdrop provides the perspective for the evaluation.

Where does evaluation enter the picture? The answer to this question depends on the type of evaluation being performed. One type, *process evaluation*, is an ongoing activity. Throughout the planning and implementation of the program, provision is made to monitor how well it is functioning. The implementers provide experiential feedback. Utilizing this, evaluators enable planners to change their expectations and also help the implementers—administrators, counselors, outreach personnel, and others—to decide to keep or change their strategies. The program is developing as it proceeds. Therefore, sometimes *formative evaluation* is the term preferred for activities in this context.

Outcome evaluation. Also known as *summative evaluation*, is the more visible and obvious type. This resembles any type of process by which we determine whether we have achieved specific objectives. Evaluation of this kind relies in many ways on research and development in the fields of sociology, psychology, and education. The tools that are used are often the same.

One of the most frequently used evaluation tools is a test given before and after the delivery of education or treatment. For example, a group of female adolescents is offered a health education course that includes a module on the risks of drinking alcohol during pregnancy. A knowledge test is given before and after the students take the course. In logic and statistical treatment, this pretest-posttest strategy of outcome evaluation is similar to a within-subjects experiment.

The program strategy also shares advantages and disadvantages with the experiment. Each student in our example serves as her own control, and this minimizes the effects of individual differences, time factors, and other confounding variables; but these advantages are somewhat offset by disadvantages of the design itself and of the evaluation context. The main problem with the before-and-after design for a single group is the incompleteness of it, because it is impossible to counterbalance it by having an after-before group. (Remember, a within-subjects design is a weak one for an experiment that involves learning or practice.)

The evaluation goal itself raises special questions that are different from those of scientific experimentation. A major difference is implied in the meanings given to the word "problem." In scientific research, this word generally refers to an unsolved puzzle, a question about which curiosity is high. In the program context, the same word has a connotation of social or physical maladaptation, of undesirable habits, and of a condition that possibly needs medical treatment.

In addition, a program component, unlike a purely experimental operation, is supposed to produce change—change of knowledge, attitude, or behavior, or all three—that will persist. Ordinarily, no one foresees that a change in the behavior of experimental subjects will be either permanent or desirable. Not so the effort to implement prevention or treatment objectives.

Knowledge. What can be done to ensure a valid assessment? The first and simplest step is to add a second group to the pretest-posttest design. Treating the drinking-during-pregnancy (DDP) module as the independent variable, the procedure would be as follows:

Group I (Experimental):
Pretest, DDP teaching, posttest.
Group II (Control):
Pretest, non-DDP teaching, posttest.

The dependent variable in this case would be the difference between pretest and posttest scores. If there is improvement in both groups, the difference between gain scores of the two groups would be assessed. Nonparametric statistical tests should be used, because it is highly unlikely that the participating subjects are unbiased random samples of the female adolescent population.

Whenever change—especially improvement—is being measured, a possible confounding can occur because of either *ceiling effects* or *floor effects*. In the case of the ceiling effect, the task performed is so easy that there is virtually no room for improvement. In the case of the floor effect, the opposite problem is apparent: The task is so difficult or so inappropriate that significant improvement cannot follow the experimental treatment. If either of these effects is suspected, the test and/or the teaching should be changed. In such a case, outcome evaluation has become process evaluation.

Another unwanted effect that requires control is the *Hawthorne effect*, so named after an experiment on working conditions in Western Electric's Hawthorne plant in Chicago. In general, this confounding effect is elicited when the subjects perceive that they are being given special attention. It could just as well be called the "microscope effect." The subjects' perception itself causes changes in behavior. In the context of our example, this means that the DDP group should not know that their learning module is different from the control module.

An additional precaution, related to the human tendency to behave differently when closely observed, is to vary the test content. This can be done by inserting the DDP questions, randomly placed, into a large test that covers several content areas. This, in effect, camouflages the principal concern with the DDP module.

If the evaluation results in a significant between-groups difference on posttest scores, there is still a large element of uncertainty. What if the control module is simply less interesting than the DDP module? What if the DDP group happens to have a better teacher? What if the time lag between teaching and posttest is different for the two groups? These are only a few of the questions that require positive controls before the outcome can be validly assessed.

The control strategies mentioned here are relatively simple. Even better assurance of reliability and validity can be attained through the use of more sophisticated designs, treating the program component as an experiment, with all the rigor that the concept of scientific research implies.

Many precautions have been suggested here because of frequent negative comments by evaluation researchers who study large numbers of evaluations and find most of them wanting. An important reason for this is lack of precise planning. In this series on statistics, it has already been emphasized that decisions about statistical methods should be included in the preliminary plans. Likewise, an evaluation procedure that is improvised and tacked onto the end of a program will usually be deficient. This means that evaluation methods are a crucially important component in the initial planning of a program.

This doesn't mean, however, that all evaluation must be handcuffed to the explicitly stated objectives. Ideally, those who plan and direct and evaluate a program will also look for surprises. That is, they will plan to evaluate unexpected results that yield valuable information about side effects. Some of these may be excellent, in terms of the program goals. Others may be harmful enough to signal a radical change of plans. To gain the maximum value from the open-minded aspect of evaluation, it should be directed by a professional who knows as little as possible about the program objectives. This supposedly "outside" person is likely to pick up on behaviors and comments that convey new ideas about the effects of the program without much formal statistical treatment.

Attitudes. Suppose the knowledge gains, however they may be measured, are substantial. So far, so good. But what about attitudes? Knowledge by itself is like a tree that has not borne fruit. Much criticism of programs is directed toward the heavy emphasis on knowledge that may turn out to be fruitless. Even if followup tests or interviews given weeks or months after completion of the program do show retention of what has been learned, they show little about attitudes.

An attitude has both personal and social implications. If the program facilitates motivation toward positive changes in one's own behalf, a positive personal attitude is possible. If the program also fosters healthy and productive interaction with others, a positive social attitude is possible.

Direct measures of attitudes that are favorites in prevention and treatment programs are rating scales. The best-known types are named Likert, Thurstone, and Guttman. The most frequently used is the type first developed by Renses Likert, an American social scientist. Using a Likert-type scale as a posttreatment measure, the evaluator attempts to assess outcomes. A Likert-type scale consists of a list of items with five responses ranging from least favorable to most favorable. These are most often stated in terms of personal agreement: "I strongly disagree" to "I strongly agree." Statistical assessment of the scale depends on assigning a numerical value of each response level (e.g., 1 for least favorable, 5 for most favorable).

If the Likert-type scale is used in a pretest-posttest design, we have evaluation problems similar to those faced when this design is used to measure knowledge changes. In addition, we now have the problem of biases inherent in self-reports. These call for the most sensitive and sophisticated methods of control known to social scientists and educators. An alternative is to accept self-reports at face value, but in the long run this can lead to large-scale problems resistant to change. For example, epidemiologists and clinicians alike have assured us that the self-report data on alcohol consumption are, at this stage of knowledge, misleading. Many people who drink classify themselves as abstainers, even on questionnaires that are

Continued on page 54

Alcoholic Hepatitis

John R. Senior, M.D.

General Facts About Hepatitis

The liver has been known for centuries to be essential for life and health. A very important form of liver disease is "hepatitis," the medical word for inflammation of the liver, which comes from the ancient Greek words *hepar* (= liver), and *-itis* (= inflammation). Hepatitis is recognized by symptoms of jaundice (yellowness) of the skin and eyes, appetite loss and nausea, sometimes with fever, pain in the upper abdomen, and liver enlargement.

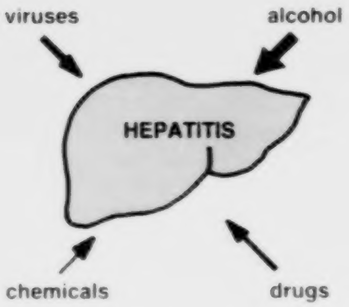
Hepatitis may be caused by viral infections, by chemicals or drugs, but in the United States the most widespread form of hepatitis is caused by exposure to alcohol, too much alcohol taken too often. People vary a great deal in how much they can tolerate without showing alcoholic hepatitis, with some people being much more sensitive to alcohol than others.

The alcoholic form of hepatitis has only been recognized as so common in the past 20 years, but had masqueraded before as "gallbladder disease," "indigestion," "bilious attacks," and other names. Alcohol also may aggravate the effects of hepatitis caused by drugs or chemicals.

What is Alcoholic Hepatitis?

Alcoholic hepatitis is a disease of the liver that lasts one to a few weeks. Its clinical symptoms come on with loss of appetite, nausea, vomiting, right upper abdominal pain and tenderness, fever, jaundice, sometimes with confusion, after a period of moderately heavy alcohol consumption. The disease usually continues to worsen even after the alcohol drinking has stopped. It may not become apparent for several days later, and may progress for some weeks before starting to get better. This separation of symptoms and effects from the exposure to alcohol may confuse people about its causative role.

Figure 1. The Major Causes of Hepatitis



The doctor may find an enlarged liver, elevated white blood cell count, and abnormal blood tests indicating damage to the liver cells and function. In some cases, the physician may find also an enlarged spleen, excess fluid in the abdomen, abnormal blood vessels in the skin, depressed nervous system function, and swollen, even bleeding, veins in the esophagus or the rectum. Mild forms of the disease may be present in the absence of any of these symptoms or findings.

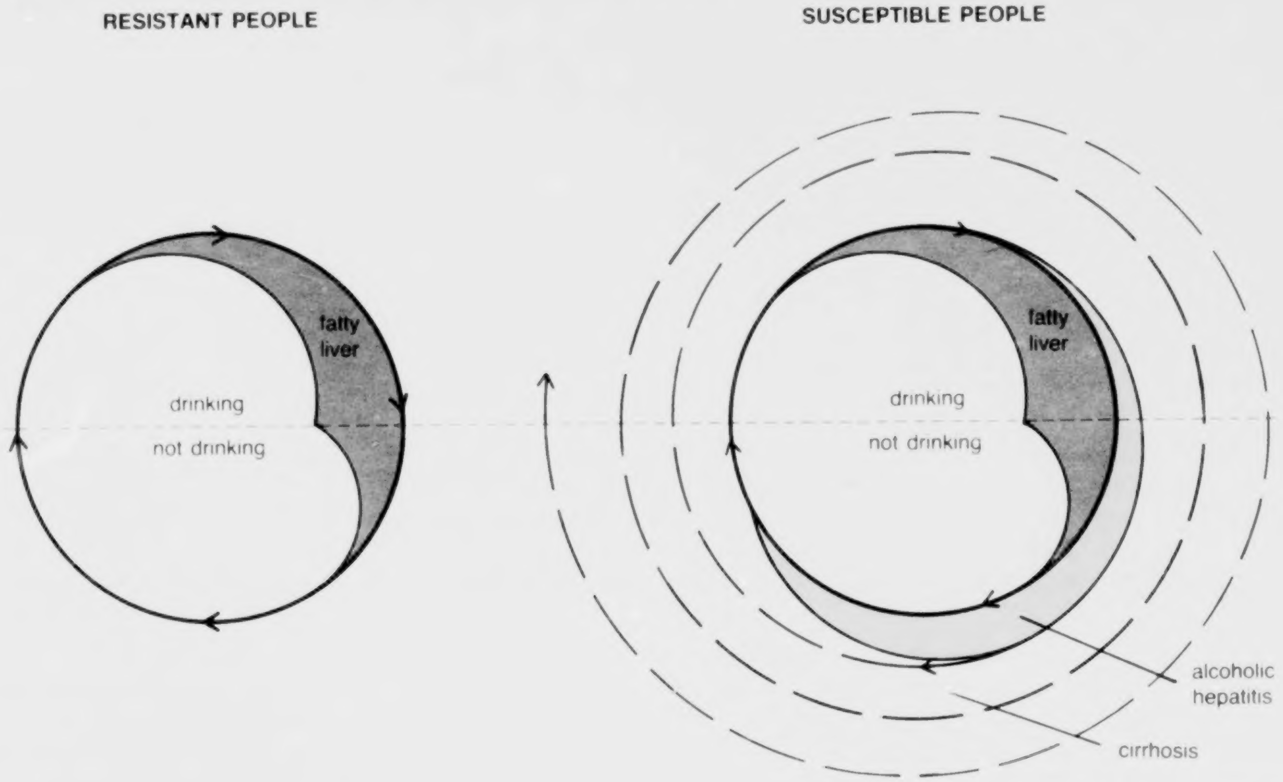
Alcoholic hepatitis is now believed to be the acute disease process which eventually leads to alcoholic cirrhosis, in most cases after repeated bouts. Relatively mild, repeated episodes of alcoholic hepatitis may be unrecognized, ignored, or inapparent, yet still result in cirrhosis years later. A bout of acute alcoholic hepatitis may be fairly severe but yet resolve almost completely, with liver healing and return to apparent health, leaving only slight residual damage in the liver. It is the accumulated damage of many attacks, usually over a number of years, that results in cirrhosis.

How Can Alcoholic Hepatitis Be Diagnosed?

Clinical symptoms, as described above, following a bout of alcohol drinking, should lead to the suspicion of possible alcoholic hepatitis. A major problem is that the symptoms are often thought to be caused by something else, since they may be worse after drinking has stopped than they were while drinking was going on. The symptoms also may be ignored or denied. Diagnosis requires alertness by the physician plus some degree of open and honest admission about symptoms and drinking patterns by patients, especially in the mild cases which are harder to recognize. Alcoholic hepatitis may be seen in people who consider themselves and who are thought to be moderate or well-controlled drinkers, especially if they happen to be sensitive to liver injury from alcohol.

Support for a diagnosis of alcoholic hepatitis is obtained by blood tests, which may need to be repeated at in-

Figure 2. The Vicious Cycle: As people cycle between periods of days to weeks of drinking and not drinking, fat accumulates in the liver during drinking periods and then disappears when drinking is stopped. In those susceptible to alcoholic hepatitis, liver inflammation and damage also occur from the drinking periods, which are slow to subside and leave residual scarring (cirrhosis) which persists and accumulates for years or permanently.



RESISTANT PEOPLE

SUSCEPTIBLE PEOPLE

tervals to establish how quickly values are changing. The diagnosis of alcoholic hepatitis does not require evidence of alcohol present in the blood, nor evidence of alcohol intoxication, present or past. It may develop in masked, hidden form over long periods while the patient is drinking "moderately" and remains free of the usual signs of intoxication. It even can develop when the person repeatedly drinks small amounts of alcohol to avoid intoxication, or has become adapted to the alcohol by developing central nervous tolerance, or both.

Proof of the diagnosis—as well as assessment of how much accumulated liver damage may have developed – is established best by liver biopsy. Liver biopsy is generally done under local anesthesia and consists of inserting a needle through the abdominal wall into the liver. A tiny specimen of liver tissue is aspirated into the needle, and the needle withdrawn. There is rarely more than minimal discomfort. Under the microscope, the biopsy specimens show a characteristic appearance in alcoholic hepatitis, as well as possible scars or distortion of liver structure from previous attacks.

Can "Social" Drinkers Get Alcoholic Hepatitis?

Unfortunately, yes. While alcoholic hepatitis is frequently discovered in persons who have the complex disorder known as "alcoholism," it also occurs in those who are not recognized as alcoholic. People differ much in their susceptibility to alcohol-induced injury to the liver, and in their nervous system tolerance for alcohol. Liver inflammation may occur without apparent intoxication or alcoholism.

Such differences may be due to individual or racial genetic variations in metabolism, to variations in immune system responses, to effects of drugs or chemicals, to nutritional effects, to influence of natural hormones, or other unknown factors. We don't know why people vary so much in their susceptibility.

While the percentage of people who are highly susceptible to liver damage from alcohol may be relatively low, there are a great many moderately heavy drinkers (including those who call themselves "social drinkers"). However, even openly alcoholic persons are not all highly susceptible to alcohol-induced hepatitis and eventual cirrhosis. The prevalence of alcoholic cirrhosis among all confirmed alcoholics is only about 10 to 15 percent at any given time.

Research suggests that women may be more prone than men to alcohol-induced damage, even if a man and a woman are the same body weight, blood alcohol concentrations are generally higher in the woman because she generally has relatively more body fat and less body water than the man. Alcohol is distributed in the body water and therefore is relatively more concentrated in women than men of equal weight.

The bottom line is that certain people seem to be especially sensitive to alcohol-caused liver injury. These susceptible people may be affected by alcoholic hepatitis and cirrhosis, even though they are thought to be socially acceptable, "moderate" drinkers of alcohol.

Is Alcoholic Hepatitis Different From "Fatty Liver"?

Yes, and far more serious. Just about anybody, whether they are alcoholic or not, who drinks alcohol heavily even for a few days, will develop some degree of liver enlargement in which liver cells are swollen with fat globules and water, a condition called "fatty liver." Fatty liver also may result from other causes, such as diabetes, obesity, cortisone-like drug treatment, or severe protein malnutrition. Fatty liver caused by alcohol is "reversible:" it disappears completely after alcohol drinking is stopped, with no residual damage. Fatty liver is no longer believed to cause cirrhosis, even though for many decades it was blamed because it occurred along with alcoholic hepatitis.

The distinction is that everyone who drinks alcohol heavily will get fatty liver, but only those who are susceptible to liver inflammation will get alcoholic hepatitis, with the risk of cirrhosis, if they keep it up long enough.

Does Alcoholic Hepatitis Always Lead to Cirrhosis?

No, and that is the hopeful message. It usually takes many years for alcohol hepatitis to produce enough cumulative liver damage to result in cirrhosis. That is the reason to be on the lookout for the early cases of alcoholic hepatitis before cirrhosis has developed, while there is still time.

Is Alcohol Hepatitis Dangerous?

It may be fatal. Alcoholic hepatitis, especially when it occurs in patients who have had previous liver damage, may be very threatening to life. It may be the final insult to that which causes hepatic failure and the death of the cirrhotic patient who has had one binge too many. Because of this, published death rates from alcoholic hepatitis are extremely variable. Rates range from a few percent to almost half the patients, depending on the special set of patients considered.

In patients with previous liver damage, and particularly in those who have had nutritional disturbances associated with drinking too much alcohol, an extremely broad range of other diseases may be seen. Almost all organ systems of the body may be affected by one or more of the medical complications, such as severe anemias, heart disease, muscle disease, skin and bone diseases, central nervous system disorders, other gastrointestinal problems, increased risk of malignancies, infections, and trauma.

It is important to recognize the alcoholic hepatitis before all this develops, to diagnose the person's susceptibility to alcohol-induced liver inflammation—and to do something to prevent it from occurring.

Can Alcoholic Hepatitis Be Treated?

Not very well. By far the best treatment is prevention of future attacks by avoidance of alcohol consumption. Once a present bout of alcoholic hepatitis has occurred, the only treatment is removal from any further alcohol exposure and supportive therapy. This includes treatment of infections, correction of imbalances in the body salts and water, avoidance of possibly damaging drugs and chemicals, the best tolerated nutrition, and time for the patient to recover. The controversy over the value of cortisone-like drug treatment of severe alcholic hepatitis seems to be resolving on the side of no likely benefit, and there is no other specific curative therapy.

Once alcoholic hepatitis has been diagnosed, and the state of liver damage to date has been assessed, the patient must understand that he or she has been identified as one of the susceptible people. So, any future course except quitting alcohol consumption is nothing other than slow but probable suicide. A very clear choice.

The problem is that people who have been drinking too much alcohol, whether at the grossly excessive level of the overt alcoholic or what is thought a moderate, "social" level, may not want to hear that message or make that choice. For the patients who are alcoholic, the road to recovery is total abstinence from alcohol and lifelong participation in a program to prevent drinking recurrence which may be lifesaving. Since it is not known whether there may be any "safe" level of alcohol consumption for a patient with alcoholic hepatitis, it is better for all such patients to avoid alcohol completely, even if they have not been considered "alcoholic."

Alcoholic hepatitis does subside, usually in a matter of weeks, and the residual damage or even full-blown cirrhosis can gradually stabilize and become quiescent. The liver has a considerable ability to heal and regenerate, as well as extra functional capacity. The prognosis for a patient who is recovering from alcoholic hepatitis is excellent—if, and only if, further alcohol drinking is stopped.

What To Do If You Suspect You May Be Drinking Too Much

Even people who do not think of themselves as alcoholic, and whose friends and associates do not think of them as such either, may be drinking more than they admit. The patient's denial of the problem - not only to others but to herself or himself - is itself a symptom of alcoholism.

It may be helpful to consider the drinking behavior pattern as a possible separate disorder or disease which undelies your liver problem. If the drinking is a problem in itself, it must be dealt with to prevent further liver damage, and other consequences. However, many doctors who diagnose and treat liver diseases or general diseases are not necessarily expert in recognizing and handling alcohol-related problems, or may not wish to ask questions about alcohol habits. You may have to take that responsibility yourself.

Ask yourself if you ever feel you should cut down drinking or feel guilty about it or what you do when you drink. Ask yourself if you have been annoyed by people criticizing your drinking. Do you need a drink either to "get going" or to "settle down"? Ask if you drink more if disappointed, upset or under pressure, or have memory lapses during periods of drinking. Are you proud that you "hold your liquor" better than other people, or are you in a hurry to get to the first drink at a party? Do you promise yourself to control your drinking or make plans to reduce it, which you don't follow?

If so, then seek advice from a physician or counselor who is concerned and non-judgemental about alcohol problems, and who wants to help you to deal with your problems.

You can also receive information about alcohol problems and their impact on you or your loved ones from local resources such as hospitals, private alcoholism treatment facilities, your State alcohol authority, a family service agency, a community mental health center, your clergyman or spiritual counselor, or perhaps an employee assistance program where you work.

For additional information, contact the National Clearinghouse for Alcohol Information, P.O. Box 2345, Rockville, MD 20852, or call (301) 468-2600.

How Does Alcohol Cause Alcoholic Hepatitis?

This is still not fully understood. Alcohol may be only one of a complex set of factors in causing liver injury, perhaps acting together with nutritional deficiencies, immune system reactions, and perhaps other factors. It may be that alcohol itself is not directly toxic to the liver. It may be that a breakdown product of alcohol, such as acetaldehyde, is more toxic. The many questions that have been raised from what has been learned up to now have led to still more unanswered questions, which represent opportunities for further research and the need to support that work.

What Is Being Done About It?

Active research is proceeding along two broad fronts: 1) how alcohol may cause liver cell injury and/or inflammation, and 2) toward better understanding of how to counteract the addicting effects of alcohol on the brain, central nervous systems and whole person. One hope of liver researchers is to find a way to intervene in the process of the liver-induced damage, to prevent and treat the inflammation, to avoid the damage and eventual cirrhosis. Another hope is that further research will allow the definition of persons susceptible to alcoholic hepatitis, to measure and perhaps to treat their susceptibility.

Overall, alcoholic hepatitis and its cirrhotic consequences cause more liver disease than all other causes combined, the economic, social and personal burden of which are enormous for the people of the United States and elsewhere. There should be a program of research support and activity which is commensurate with the magnitude of this problem.

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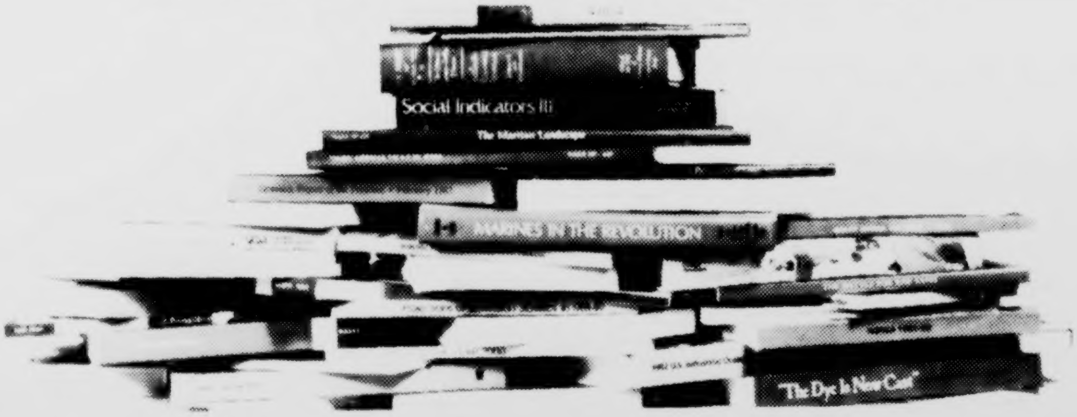

Reader's Exchange

Use of Family Treatment Methods by Alcoholism Treatment Services

Curtis Janzen, Ph.D.

A nonrandom survey of treatment services for alcoholics in 37 States indicates that a broad variety of programs provides services to families of alcoholics. These programs vary in providing services to family members on an individual or group basis and in whether family members are seen separately or jointly with the alcoholic. Services to both nuclear and extended families are generally offered. There is concurrence among the respondents that services are helpful to the alcoholic.

A review of the literature on family treatment for problems of alcoholism conveys the impression that family treatment is widespread in agencies serving the alcoholic population. Some reports (Kaufman and Kaufman 1979; Regan et al. 1983; Steinglass 1976; Wegscheider 1981) also convey a wide variety of reasons, purposes, and modes in their involvement of family members. However, there seems to be no clear definition of what family treatment is. Nor is there a clear, consistent, and definitive formulation of how it is done, why it works, or what its results are, though various reports have responded in limited ways to each of these questions.

The present report provides a broader view of whether practice confirms what the literature conveys. It addresses questions about the content and kind of services to families, the age and sex of patients whose family members are served, the reasons for involving families, and the goals, values, and outcomes of family treatment. Responses to the survey questionnaire came from persons requesting reprints of the author's earlier paper "Family Treatment for Alcoholism" (1978). One hundred forty-one usable responses from 37 States were obtained. Representativeness of the responses of all alcoholism treatment services, however, is not assured.

Auspices

Responses to a question about the auspices of the family treatment services for alcoholics were quite diverse. Forty-six percent of the responses came from community-funded services such as hospitals, clinics, and social agencies; 31 percent from publicly funded hospitals or clinics including those for veterans; 16 percent from private practitioners; and a small number from employer-sponsored programs (both public and private)—presumably employee assistance programs. Thus, it seems that the incorporation of family treatment has progressed on a wide front and has gained broad acceptance as serving a useful purpose in alcoholism treatment.

Patients Served

Among the agencies responding, 33 percent provided service to both sexes and all ages. Only a small number of programs limited their services to a single age or sex category. Inpatient service was generally limited to 6 weeks or less. Services to outpatients in most responding programs, however, did not appear to be time limited. Analysis of the survey results revealed that 40 percent of the programs offered services to alcoholic patients themselves on both an inpatient and an outpatient basis, while 60 percent offered only inpatient or only outpatient services.

Family treatment services generally were offered throughout the duration of care, though the intensity of family contacts was found to vary.

In order to assess the relative weight placed on family treatment, respondents were asked whether family involvement was a condition of treatment or was only requested. Family involvement was made a condition of treatment for the alcoholic in 15 percent of the responding facilities. Another 80 percent requested family involvement in the treatment plan. Only 4 percent offered no service to the family of the alcoholic patient.

The majority of programs offered service to any interested member of the alcoholic's nuclear or extended family. In only a small number of instances was service limited to particular family members such as spouses, parents, or children.

Treatment Modes for Family

The form of service to family members was variable. Services offered to spouses only were provided primarily through separate individual sessions or group meetings. Conjoint sessions of spouses and alcoholics comprised the sole method of contact in only about 9 percent of the cases.

Children of alcoholics were most often (48 percent) treated in a combination of separate sessions for them along with sessions for the whole family. In a small number of instances separate treatment groups for children were offered, but this was never the sole method of service to the children.

Parents of alcoholic patients were eligible for treatment services in all instances

Most frequently (49 percent), they were seen both separately and conjointly with the patient, although in some instances (17 percent) only conjoint sessions were offered. In two programs featuring separate groups for parents, the alcoholic patient was an adolescent.

In sum, 87 percent of the programs offered services to family members, including all members of the nuclear family, and to the parents of adult patients as well. Data on involvement of adult siblings in these treatment programs was not solicited.

About 67 percent of the responding programs follow up their cases after the termination of treatment in an effort to assess efficacy of treatment and level of family functioning. In the present survey, data were not sought on the specific results of followups. However, this is a highly important area for research on the effects of treatment because the extent of services offered to family members shows that treatment services for the family are considered worthwhile. Although previous reports suggest that family work is efficacious, sophisticated research that would statistically confirm this impression has not been undertaken, to the author's knowledge.

Treatment Philosophy

Respondents were asked to indicate their reasons for involving family members in treatment. The intent of this open-ended question was to determine whether family intervention was seen by the treatment service as a way of helping the alcoholic or as a way to provide treatment to members of the alcoholic's family. At this broad level, 21 percent of the responses indicated that the program's focus was on helping the alcoholic. However, in nearly 75 percent of the programs, the responses reflected awareness that the family as a whole needed help for its own sake. In only a few instances was the concern about the identified alcoholic secondary to concern for the family.

Respondents conveyed in various ways that they involved the family in treatment in order to help the alcoholic. Pessimistically, one said that "it is highly unlikely that the client will recover otherwise." Others indicated that family involvement "facilitates" or "reinforces" recovery, "increases the success rate," provides "support for the patient," or that the family could be "trained to help the alcoholic." A number of comments implied that family members are often "enablers for continued drinking," that the "family should change and be supportive," or that the family interferes with treatment of the alcoholic. Some programs were interested primarily in involving the family to seek diagnostic understanding of patient and family.

A small number of respondents seemed interested in treating the family for its own sake when the initial contact was made by a family member. Family members are, in their view, the primary patient and need help to deal with their feelings about themselves and the alcoholic. Further, problems other than the alcoholism needed attention, such as marital communication, sex, and child rearing. Improving communication, helping family relationships, and addressing interpersonal family problems apparently were goals in their own right.

The larger number of respondents however, involved the family because they viewed alcoholism as "a family disease" or "a family problem," thus seeming to endorse the idea that the family is an interactive system. Help is not for just the alcoholic or just the family but for both. There also was explicit recognition that if drinking stopped, lifestyle changes would occur and that all members would need to understand these and adapt to them. These survey responses conveyed clear recognition of interactive effects between change in the family and change in the alcoholic.

Gains From Family Involvement

Respondents were also asked to specify differences resulting from including the family in treatment. One-fourth of the respondents focused on the positive results for the alcoholic, and of family treatment services; and one-third were reportedly impressed by the improvement in functioning of the entire family.

The effect of family involvement, then, was seen as positive. One respondent reported that family involvement in treatment helped break through defenses and, by "confrontation" with "reliable information," undermined the patient's "denial." Family involvement was said to improve the client's attendance rate during treatment and to increase the alcoholic's chances of recovery.

More specific benefits for the family were reported by some survey respondents: members can "quit blaming" themselves and can develop into "full-functioning individuals;" they "learn they are not alone;" and treatment "gives them coping skills."

General improvement in family relationships and remediation of family problems were frequently mentioned. More specifically noted were improvements in family unity, reduced anxiety, fewer symptoms, increased awareness and tolerance of one another, improved adaptability and ability to communicate, and increased ability to resolve problems. Child adjustment and marital adjustment were improved and, on a more concrete level, fewer divorces were noted.

Treatment Theory

An open-ended question yielded information about particular methods or treatment theories that were utilized to organize the program's approach to patient and family.

In this context of method and theory, the responses became less definitive. Fewer than half of the respondents specified a particular method of service to the family. A small percentage of programs identified their primary service to be referral to another program or agency, usually to Alateen or Al-Anon. About 20 percent of those who responded to this question said that their service to families was an educational approach. In some instances, this was further specified as education about recognition of alcoholism as a disease and about awareness of community service for alcoholics and their families. Other responses referred to use of groups and of special techniques such as communication exercises, contracting, confrontation, family hope exercises, and an emphasis on responsibility.

About 67 percent of the respondents indicated that they drew on identifiable treatment theories. The largest number (33 percent) referred to "family systems" as their theoretical orientation. From a previous analysis (Janzen 1977) of their focus on the interactive effects of family behavior and the behavior of the alcoholic, it seems likely that reference was to a broad use of this term, one in which the family and the patient comprise an interactive system.

The next largest group of responses fell into an "eclectic" category (13 percent) either self-identified as such or implied through a listing of several treatment theories from which their treatment approach is derived. Some (10 percent) have adapted "reality therapy" to their work with families. In similar numbers, reference was made to a communications approach and to a structural family therapy approach. About 7 percent of the respondents identified the theory or the methods of the Johnson Institute as their own.

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Reader's Exchange

Self-Handicapping Alcohol Abuse

Steven Berglas, Ph.D.

Now a recovering alcoholic, Derek Sanderson looks back upon his career in professional hockey and recalls that he was "absolutely clean and straight" during his early years with the Boston Bruins. His ability on the ice soon earned him Rookie of the Year honors, two Stanley Cups, and a $2.65 million contract.

Yet, at the height of his career and with wealth greater than he had ever imagined, Sanderson was panic-stricken. "I had the money, the fame, everything I wanted—but I started fearing that I was going to lose it," he says. He began drinking to quell his fears.

Five years after signing his multimillion dollar contract, Sanderson—once the highest paid professional athlete in the world—was a skid-row alcoholic.

Can success lead to alcoholism? It is a connection that researchers and mental health professionals may wish to explore further and, indeed, are already doing so through investigations of the self-handicapping model.

Self-Handicapping Model. The self-handicapping model of alcohol abuse (Berglas, in press *a, b;* Jones and Berglas 1978; Tucker et al. 1981) describes the manner in which certain success experiences may be causally linked to alcohol abuse disorders. At the core of this formulation is the observation that alcohol has a performance-inhibiting reputation (MacAndrew and Edgerton 1969) that can be exploited by individuals who wish to avoid the negative implications of failure and enhance the positive implications of success. As a result of strategically-timed "benders," the self-handicapper creates an essentially "no-lose" situation because alcohol blurs one's *personal* responsibility for outcomes enacted "under the influence."

The goal of the self-handicapping alcohol abuser is quite clear: to *preserve* and *protect* his or her positive self-esteem from the threat posed by the need to replicate superior levels of achievement. The self-handicapper is not seeking to improve a negative self-conception as, some have argued, alcoholics are predisposed to do (Kinsey 1966). Nor does he (or she) drink as a result of self-critical tendencies (Williams 1965). Instead, the self-handicapper is trying to structure his world to protect against *loss* of a positive self-conception. The reason why someone who has previously been successful would experience this fear is central to understanding self-handicapping alcohol abuse.

The Initiation and Maintenance of Self-Handicapping Alcohol Abuse. In order to understand why self-handicapping alcohol abuse would be initiated following the experience of success, the competency image of the self-handicapper must be examined. Specifically, why he lacks the faith that his abilities can withstand repeated assessments must be explained. Berglas and Jones (1978) hypothesized that the learning history of the self-handicapper prevents him from determining that he can replicate successful performance at will. Their experiments designed to evaluate this hypothesis demonstrated that one instigator of self-handicapping behavior is a learning history dominated by noncontingent success experiences.

Noncontingent successes are positive outcomes not subject to personal control (Abramson et al. 1978). The experience of noncontingent success derives from the perception that desired outcomes are a function of extraneous factors such as luck, connections, beauty, or membership in the right family or social circle.

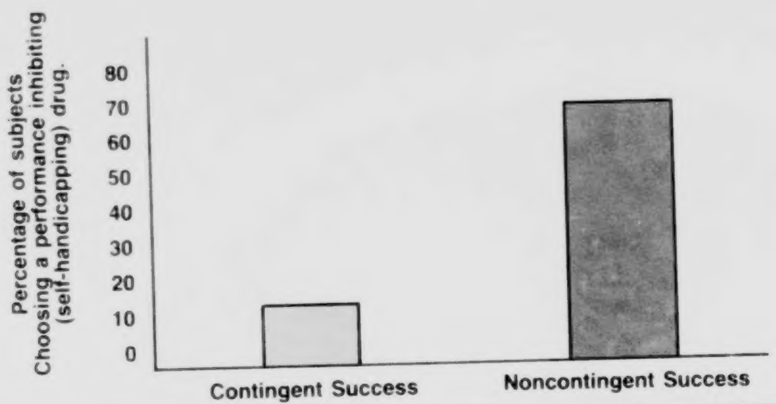
A crucial consequence of experiencing noncontingent success is a person's fear that he will be unable to exert control over the instrumental behaviors necessary to insure ongoing success. Thus, the recipient of noncontingent success can never be sure that success will ever come again.

The difficulties posed by noncontingent success have been investigated empirically. Berglas and Jones (1978) developed the experimental paradigm most commonly used for examining the effects of noncontingent success on propensity to self-handicap. Although reexamination of their paradigm has refined the Berglas and Jones formulation (Kolditz and Arkin 1982; Tucker et al. 1981), their central finding is replicated with reliability: There is a high significant trend among male subjects who receive noncontingent (vs performance-contingent) success to select performance-inhibiting (vs performance-facilitating) drugs or greater quantities of alcohol prior to a reassessment of their performance capabilities (See Figure 1).

It is easy to see why successful people, even those with undeniable talent, experience inordinate levels of stress derived from their need to meet or exceed burdensome performance expectations. The motivation to relieve anxiety derived from the burden of expectations is thought to be what leads the self-handicapper to begin drinking abusively (Berglas, in press *a*).

The Relief Provided by Self-Handicapping Alcohol Abuse. The most com-

Figure 1. The effects of contingent vs. noncontingent success experiences on the motivation to self-handicap (adapted from Berglas and Jones 1978).



monly reported reason for drinking offered by alcoholic patients is "relaxation" or "the relief of anxiety" (Edwards 1972; Wanberg 1969). Clinicians working with populations of alcohol abusers corroborate the fact that alcohol has a widespread reputation as an effective anxiolytic (McHugh et al. 1979). Self-handicapping alcohol abuse is a specialized example of this general rule. Both laboratory (Tucker et al. 1981) and survey studies (Berglas, in press *b*) find that self-handicapping alcohol abuse is initiated to relieve a specific type of anxiety: a feeling generated by impending evaluations that threaten an individual's favorable but fragile sense of self-esteem.

The Widespread Occurrence of Self-Handicapping Alcohol Abuse. It is easy to see why a superstar like Derek Sanderson would become anxious about losing esteem gains when there is such a phenomenally large amount to lose. But what about the rest of us? Does the average person protect self-esteem by abusing alcohol? In a wide range of settings, the answer appears to be yes.

It is estimated that no more than 18 percent of all alcohol abusers meet the criteria proposed for a diagnosis of self-handicapping alcohol abuse (Berglas, in press *b*). The most commonly reported context for the initiation of self-handicapping alcohol consumption outside of the workplace is the singles' bar or the bedroom (Berglas, in press *a*). Quite simply, those who are legitimately anxious because of the expectations inherent in dating or mating behavior can achieve a time-out from performance requirements if they are seen as being temporarily incapacitated by alcohol.

Once the syndrome of self-handicapping alcohol abuse is understood, it can be seen in a limitless number of contexts (Jones and Berglas 1978). It has a particular appeal to individuals in the twilight of successful careers. In this instance, the fear of losing previously acquired esteem gains is fairly accurate. Many "senior" stars or "former" greats would rather attribute the demise of their career to Demon Rum instead of a diminution of their abilities. The reasoning here is simple: "When I get off the sauce, I'll show them that I haven't lost the touch."

There is one limitation to esteem protection afforded by self-handicapping alcohol abuse: In order to be effective it must be time limited. Chronic self-handicapping behavior does not protect self-esteem (Berglas 1985; Berglas, in press *a*). The reason for this is quite simple. Transient alcohol abuse, binge drinking, or the like, is thought to disrupt normative levels of competent functioning. As such, it provides an intermittent excuse for failures which, following prior success experiences, can be viewed as exceptions to previously established rules. Alcohol dependence, on the other hand, implies a normative level of functioning that establishes a new set of rules and expectations far below those held for self-handicappers.

Research on self-handicapping alcohol abuse further delineates subtypes of abusers whose disorders develop in response to specifiable sets of circumstances and follow predictable patterns (Berglas, in press *b*). When the dynamics of this particular type of alcohol abuse become more clearly understood and that understanding is applied to populations of alcoholics receiving treatment (Wright and Obitz 1984), strategies for designing treatment approaches for specific subtypes of abusers will become both simpler and more effective. ☐

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Epidemiologic Bulletin 10

1983 Alcohol/Health Practices Supplement

Henry Malin, M.A.
Ronald Wilson, M.A.
Gerald Williams, D.Ed.
Sherrie Aitken, D.P.A.

Preliminary findings from the Alcohol/Health Practices Supplement to the 1983 National Health Interview Survey (NHIS) suggest an apparent increase in the number of alcohol abstainers in the U.S. population, particularly among women. The percentage of abstainers, however, varies considerably among different sociodemographic subgroups in the population. For example, white males and females are the least likely group to be abstainers, while over half the population reported as Native American and Asian[1] are in the abstainer category.

Distributions of average daily consumption, expressed in terms of absolute alcohol, suggest different patterns of consumption by sex-age groups. Average daily consumption for men tends to increase steadily through ages 45–54 years, decreases for the 55–64 age group, then increases again after age 74. Average daily consumption for women, much lower than for men, tends to be more evenly distributed across the age categories.

Self-reports of problems related to drinking indicate that 16 percent of the male drinkers and 6 percent of the female drinkers have encountered personal problems associated with drinking sometime during their lifetime. The problems are related to marriage and family, health, job or work, injuries associated with drinking, and motor vehicle accidents or violations. As expected, drinking-related motor vehicle accidents and/or traffic violations were the problems most frequently cited by men (9 percent of male drinkers). Drinking-related family or marital problems were most frequently cited by women (2 percent of female drinkers).

Background

The Alcohol/Health Practices Supplement to the 1983 NHIS was administered in a national household survey to 22,418 men and women aged 18 and older. The supplement, a cooperative endeavor of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Center for Health Statistics (NCHS), is the largest detailed survey on drinking ever conducted in the U.S. It contains questions on drinking practices, health practices, health conditions, self-classifications of drinking level, problems associated with drinking, and detailed quantity-frequency-variability (QFV) items on the consumption of beer, wine, and spirits.

The purpose of this brief paper is to present some of the preliminary findings from the supplement while more focused studies are being conducted by NIAAA and the Alcohol Epidemiologic Data System. Such studies will include methodological issues related to the measurement of consumption, the construction of drinking categories, drinking patterns by sociodemographic subgroups of the U.S. population, and indepth studies of the health consequences of different levels of alcohol consumption.

Methods and Definitions

For this paper, responses to the supplement have been weighted by sex, age, and white-nonwhite categories to represent the total U.S. population aged 18 and older in 1983. Abstainers are defined as persons who consume fewer than 12 drinks a year or who have not had a drink in the past year. Lighter, moderate, and heavier drinkers are defined by their average daily consumption of absolute alcohol: lighter drinkers (.01 to .21 oz); moderate drinkers (.22 to .99 oz); and heavier drinkers (1.00 oz or more).

To arrive at total alcohol consumption, the consumption levels of beer, wine, and spirits were calculated separately and then summed. For each type of drink, the subjects were asked to report (a) number of drinking days, (b) number of drinks on each of those days, and (c) number of ounces in a typical drink. Ounces of alcohol were converted to ethanol by the factors of .04 for beer, .15 for wine, and .45 for spirits. The total number of ounces of ethanol consumed by each individual was then divided by 14 (the number of days in the reporting period) to obtain an average daily consumption estimate.

These procedures for estimating average daily consumption of ethanol and classifying individuals into lighter, moderate, and heavier drinking categories have been used frequently in the literature (see Clark and Midanik 1982; Williams et al. 1985; Wilsnack et al. 1984).

Preliminary Findings

Table 1 presents the percentages of drinking levels from the 1983 Alcohol/Health Practices Supplement compared with previous national surveys of drinking. The surveys prior to 1979, consisting mostly of Harris surveys of drinking, have been summarized in a trend analysis by Johnson and coworkers (1977).

Results in Table 1 suggest a 1983 increase in the percentage of abstainers in the U.S. population. Females, in particular, seem more inclined toward abstention than in past years. However, because the different surveys define "abstainer" differ-

Table 1. Percentages of Drinking Levels by Sex, 1971–83

Drinking Levels	1971–76 Average	SRG 1979	HIS 1983
Males			
Abstainers	27	25	28
Lighter drinkers	28	29	28
Moderate drinkers	28	31	28
Heavier drinkers	18	14	16
(N)	(847)	(755)	(9,327)
Females			
Abstainers	43	40	50
Lighter drinkers	36	38	30
Moderate drinkers	17	18	15
Heavier drinkers	4	4	4
(N)	(889)	(1,003)	(12,446)

Note: *Adapted from Clark and Midanik, 1982. Column precentages may not add to 100 percent because of rounding. Weighted percentages. Sample N's are in parenthesis.*

ently, the apparent increases in abstention are not conclusive.

Figure 1 presents the estimates of average daily consumption of ethanol for males and females by selected age groups. These results suggest that average daily consumption for males tends to increase from the age of 18 through the 45–54 age range after which the average daily consumption decreases. However, the graph also indicates that average daily consumption for men tends to increase after age 74. This finding was unexpected and suggests the need for closer examination of alcohol consumption and drinking patterns of men aged 65 and older.

Figure 2 presents the percentage of abstainers for selected racial or ethnic groups in the U.S. population. These results emphasize the variability among different subgroups in the population. Abstention, as defined in this study, is more prevalent for both men and women among all of the minority groups in comparison with whites. In particular, these results suggest that drinking among Hispanic[2] males may not be as prevalent as suggested previously. (See Clark and Midanik 1982.)

Figure 3 presents the lifetime prevalence of alcohol-related problems that were self-reported in the supplement. The most frequently reported drinking problem for men is motor vehicle accidents or traffic violations, followed by family or marital problems, injuries, and health problems, in that order. Job or work problems related to drinking are not especially salient for men or women, or perhaps the respondents did not associate such problems with their drinking. Sixteen percent of the men and 6 percent of the women drinkers in the 1983 survey reported one or more problems associated with drinking.

Conclusions

Preliminary results from the 1983 Alcohol/Health Practices Supplement to the NHIS suggest that drinking patterns may be changing slightly. In comparison with previous survey data, there appears to be an increase in the number of abstainers in the population; but different definitions of abstainer groups may confound this interpretation.

Men consistently outnumber women in terms of drinking-related problems, especially in association with motor vehicle accidents and traffic violations.

Patterns of average daily consumption of ethanol for different age groups suggest that male drinkers age 65 and older may be a special group for detailed analysis in terms of drinking levels and drinking patterns. The increase in average daily consumption for men in this age group may reflect male-specific reactions to aging and to the retirement years.

The distribution of abstainers among various racial or ethnic subgroups in the U.S. population suggests that the magnitude of drinking among specific subgroups, especially Hispanic males and Native American males, may be less than previously thought.

Further research using the wealth of data in the Alcohol/Health Practices Supplement is under way at NIAAA and the Alcohol Epidemiologic Data System. Future research will focus on examining in more detail the results presented here.

Footnotes

1. Native American includes American Indian, Eskimos, and Aleuts. Asian includes Pacific Islander.
2. Hispanic is not mutually exclusive of the other racial and ethnic categories.

Figure 1. Average Daily Consumption of Ethanol for Drinkers by Age and Sex

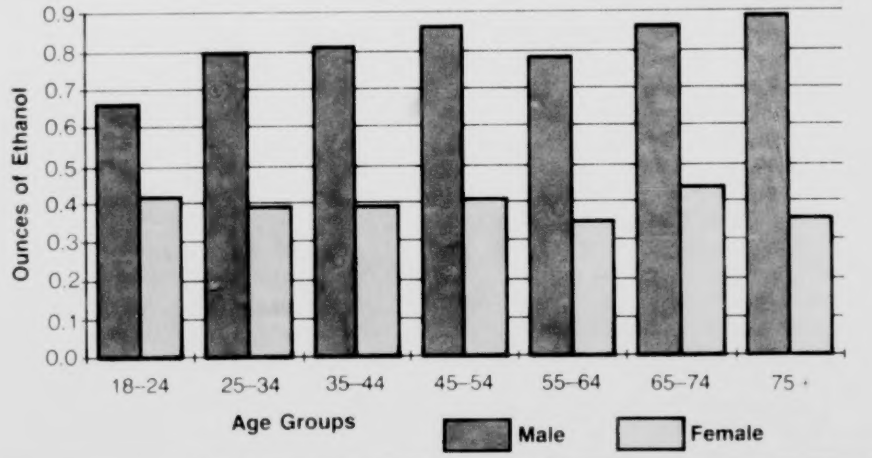
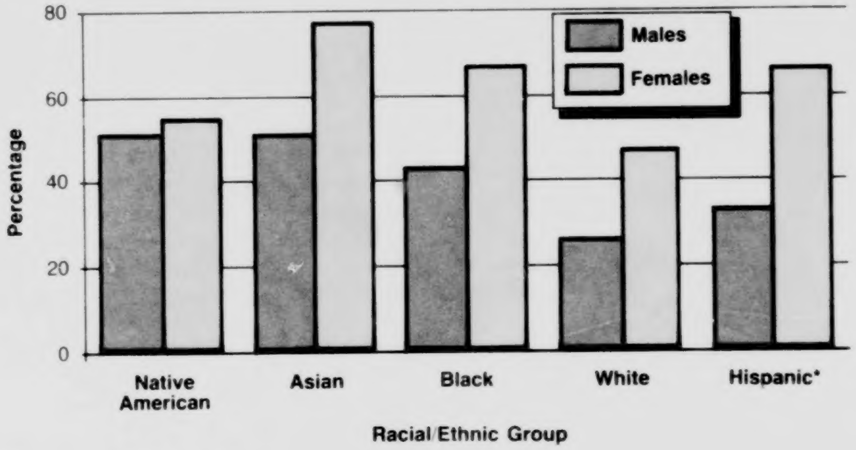
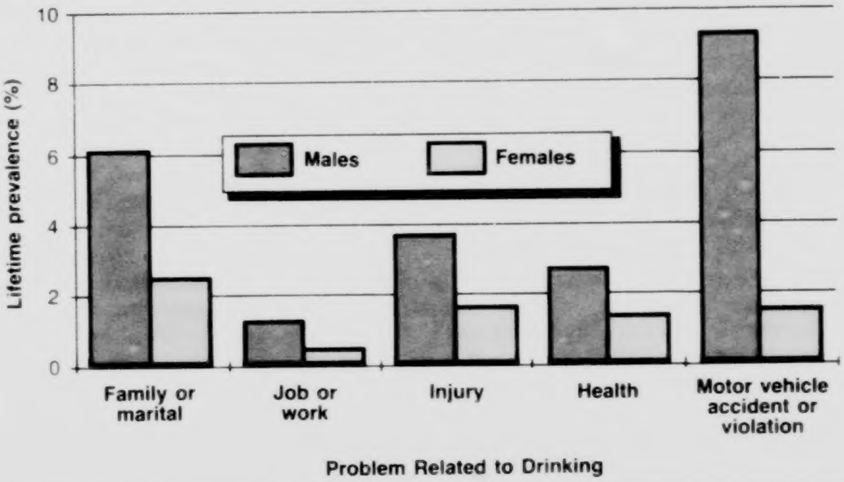


Figure 2. Percentage of Abstainers by Racial or Ethnic Group



*Not mutually exclusive of other categories

Figure 3. Prevalence of Problems Related to Drinking by Sex



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CALL FOR PAPERS

5th Annual Maine State Alcohol and Drug Abuse Prevention Conference

AUGUSTA, MAINE: Planners for Maine's fifth annual Alcohol and Drug Abuse Prevention Conference are initiating a call for papers and/or proposals for workshops to be presented at the Conference at Colby College in Waterville on June 12 and 13 1986. The focus of the Conference will be to emphasize strategies and models for prevention of mental health and substance abuse issues involving children of alcoholics. Papers and/or proposals should highlight prevention projects that deal specifically with the special needs of children of alcoholics.

Each paper and/or proposal submitted should be adaptable to a 1½ hour workshop format, and may include any or all of the following: 1) empirical research, 2) conceptual or methodological issues, and 3) innovative clinical and/or training techniques. Studies in the planning stage or with incomplete data are not appropriate for submission. Proposals should be no more than 500 words, typed and double-spaced, and submitted in triplicate with a cover letter. Applicants should also include two self-addressed, stamped envelopes. Each paper and/or proposal should include the following: 1) focus and title of paper, 2) name and affiliation of presenter(s), and 3) full addresses and telephone numbers of all authors.

Paper or proposals must be received no later than 5 PM, March 1, 1986. Send all submissions to:

Stephen Ranslow
Alcohol and Drug Abuse
Clearinghouse
State House Station #11
Augusta ME 04333

Alcohol and Sexual Dysfunction

Continued from page 13

tensive laboratory and clinical research efforts, the damaging effects of chronic, heavy alcohol abuse in men is well documented. Though less is known about women and alcohol problems, a growing body of research literature suggests that for females and their offspring the danger is serious.

New information is becoming available, as well, on the differences between female and male responses to alcohol as a toxic agent. On the other hand, men do not seem to differ markedly from women in their expectations and subjective impressions regarding the use of alcohol as an arousal agent. Laboratory studies have helped to clarify that these impressions are probably psychological and cultural rather than based on physiological changes.

Convergence of research results from all areas of alcohol research will be needed to establish firm principles on which to base effective prevention and treatment strategies. ☐

***Dorothy T. Moore, Ph.D.**, a member of NCALI's materials development staff, received her Ph.D. in biopsychology from the University of Chicago in 1975.*

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Alcohol and Drug Abuse Among American Military Personnel

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cially the widespread use of urinalysis as a deterrent, apparently had been effective, though it did not completely eliminate drug abuse. Clearly, more must be done to bring under control the abuse of alcohol and drugs by military personnel. The 1982 survey results raised two important questions: What can be done to reduce the effects of alcohol abuse on work performance, and what additional measures are needed to further curb the abuse of illicit drugs?

In addition to its strict policy against drunk driving, the Department of Defense is considering two new measures to reduce alcohol abuse. First, alcohol breathalyzer tests will be used more widely in connection with accidents and other incidents involving injury. The other new measure will be the establishment of a specific blood alcohol level to define impairment for duty. Any servicemember with a blood alcohol concentration at or above the established cutoff level while on duty will be considered impaired and will be evaluated for appropriate rehabilitative, disciplinary, and administrative action. Just as with the use of urinalysis for illicit drugs, treatment and rehabilitation will be made available for motivated servicemembers with serious problems.

While deterrence has proved to be a successful prevention strategy, the 1982 survey results indicate that its success was limited. New means must be employed to change the attitudes of servicemembers regarding the use of alcohol and other drugs. To accomplish this goal, the Department of Defense is developing strategies to encourage gradual, voluntary changes in lifestyle. DoD policymakers hope to make healthy living patterns the norm associated with military readiness, so that abuse of alcohol and other drugs (as well as other health risk behaviors) will be regarded by the peer group as incompatible with military service. The degree of success of this approach will not be known for at least a decade, but the 1982 survey seems to indicate that deterrent measures need to be supplemented by other prevention methods. ☐

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Alcohol, Spirituality, and Recovery

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do two things: not only talk about the possibility of a way out but also to break through people's denial, through the sense of "I can handle it."

AH&RW: If you had to write a handbook on surrender and acceptance, what would you say?
CW: Surrender is a major issue on recovery from alcoholism or co-alcoholism [being painfully involved in another's alcoholism]. To surrender, we've got to realize that surrendering is going to be beneficial, [although] sometimes we're just pushed so far that we're against the wall and there's no other way but to surrender. What we're surrendering is a part of our ego—the ego that wants to be in control, wants to be right, wants to win. With the alcoholic, it's a giant step to [admit that the drinking is out of control and then to] surrender his control over alcohol—admitting the powerlessness and unmanageability is an unbelievable act of surrender. They usually can't do it in one sitting, in one try. It's got to be done over and over again.
JD: I think I would go back to what psychiatrist Harry M. Tiebout says, that surrender is not a willed process, and that there are dynamics to it that we don't fully understand. If you could write it out, and publish it, and sell it, then people could buy it and say "Aha, now *I* did it!"—but that would be the antithesis of surrender. The best thing you can do is to be open to it, don't drink, and go to meetings. If a person is willing to do that, they will hear enough at meetings, and experience enough care, that they can let go of the denial and come to some degree of acceptance.

AH&RW: Is trying to surrender or give up the ego a way of beginning to open up to the divine?
CW: Yes, but it's the "egocentric ego" we're talking about, not the total ego. We don't want to obliterate the total ego, because we want to have some left to function well as human beings. The egocentric ego is the one that is rigid, wants to be in control, to be right all the time, to manipulate people. There is another part of the ego that is left after that one is surrendered, that can be called the strong or flexible ego.

The Twelve Steps and other spiritual paths nearly all help to strengthen the ego by gradually eliminating the egocentric aspect, leaving the flexible ego—which has surrendered itself to the will of the higher power. But it still takes care of business—you have to remember to put your clothes on every morning, remember your zip code, and all that stuff.

AH&RW: How does surrendering the ego help you to see what the will of the higher power is?
CW: You can't understand it intellectually, you have to understand it experientially. You have to feel it in your heart and in the depths of your being.

AH&RW: Is that experience one of the end results of spiritual practices like meditation?
CW: Yes. Once you experience it and incorporate it into your everyday life—that's serenity, or at least one definition of it.

AH&RW: But someone might succeed at surrendering the ego and practicing meditation and/or Twelve Step work, and still not achieve serenity.
CW: Yeah, if they were wedded to the method of working at it. All methods are a trap. There's a wonderful Zen story, called "Try Softer":

> A boy came to see the Master.
> "What do you wish of me?" the Master asked.
> "I wish to be your student, and become the finest Karateka in the land," the boy replied. "How long must I study?"
> "Ten years, at least," the Master answered.
> "Ten years is a long time," said the boy. "What if I studied twice as hard as all the other students?"
> "Twenty years," replied the Master.
> "Twenty years! What if I practiced day and night with all my effort?"
> "Thirty years," the Master said.
> "How is it," asked the boy, "that each time I say I will work harder, you tell me it will take longer?"
> "The answer is clear. When one eye is fixed upon the destination, there is only one eye left with which to find the way."

There are many people who get attached to the method—attending AA meetings or "working" the Twelve Steps—who don't ever get much serenity at all.

AH&RW: So there are no guarantees: you can work the path and it might not get you anywhere.
CW: There are no guarantees. But the chances are, if you work it "softly"—regularly, with discipline, *and* softly—you know, "easy does it" in AA's phrase . . .

AH&RW: Don't get attached?
CW: That's right: don't become attached to getting serenity, and don't be attached to the method.

AH&RW: That's a tough concept. What does "being attached" mean?
CW: Being attached means that you have formed a special relationship with it.

AH&RW: So that not being attached means having no expectations.
CW: Yes. The other thing is, you really can't "get" serenity or find serenity by any mechanism that is outside of you. What happens is that you discover the serenity that is already you. Serenity is our natural state. It's a paradox: while we seek it through daily spiritual practice and surrender, the only way to find it is to give up trying to find it. ☐

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The opinions expressed in this interview are entirely those of the participants and do not necessarily reflect those of *Alcohol Health and Research World* or the National Institute on Alcohol Abuse and Alcoholism.

Statistics in Research Reports

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anonymous. Exactly how many do this, no one really knows.

What to do about this problem in evaluation research? Obviously, rigorous study design and statistics are called for, and it is best to err on the side of caution in reporting program evaluation results. Other measures to build into the evaluation procedures are indirect indicators of attitudes. They are, in a sense, behavioral self-reports. Some that can be quantified and statistically analyzed are absences, late arrivals, talking at inappropriate times, intentionally irrelevant questions, and other signs of flagging attention. Evaluation requires systematic observation combined with a method for recording and then analyzing these behaviors statistically. Needless to say, this has to be done unobtrusively, so that the subjects are not aware of the systematic nature of the observations.

Another device for measuring attitudes less directly than the scales is the *semantic differential,* an invention of an American psychologist, Charles Osgood, and his associates. The subject is given a list of concepts (e.g., curiosity, intelligence, patriotism) and asked to rate each one on several dimensions (e.g., strong-weak, cruel-kind, tense-relaxed). Each dimension is itself a seven-point scale. In our example, some appropriate concepts may be alcohol dependency, health, and pregnancy. Alcohol dependency may be rated by a subject as closer to "weak" than to "strong." In any case, all concepts in the list are rated on all dimensions listed.

The results of using the semantic differential as an attitude scale are usually depicted in the form of a graph and are more difficult to evaluate statistically than the results of a Likert-type scale. In general, they are useful for individual use rather than for group testing. For evaluation of programs emphasizing individual counseling, this concept-oriented strategy may be advantageous. The connection with individual attitudes is also more subtle than the usual self-report format.

Behavior. Generally speaking, the long-term goal of any program is a behavioral change. This is the crux of effective outcome. In some situations, behavior is much easier to evaluate than knowledge or attitudes. In the field of alcohol prevention and treatment programing, however, it is usually difficult to assess behavior. Much research, in fact, is currently devoted to finding ways to measure abstinence or relapse after alcohol treatment. Self-reports are not adequate. Some clinicians advocate physiological tests. There is as yet, however, no sure way to determine whether and how much a patient is abusing alcohol. For a prevention program focused on helping women to stop drinking (as in the Seattle Pregnancy and Health Program, described in this issue), a relevant problem is the tendency of women to drink less openly than men do and to be more inclined to underreport the amount they drink. The usual questionnaires and interviews can, of course, continue to be used in epidemiological surveys. Following a large-scale program, this should reveal some behavioral change; but such assurance is not at all certain. In other health-related areas, we find wide variations in program effectiveness without necessarily being able to explain why.

Evaluation of behavioral changes will probably continue to rest on epidemiological methods, perhaps supplemented in individual cases by direct observation and examination. An obvious goal for both evaluation and epidemiological research is to develop innovative and effective methods to identify and quantify alcohol-related behavior.

Conclusion

Looking back on the history of scientifically oriented research, it seems inevitable that statistics would develop as a companion discipline to all sciences. The values of science virtually demand such methods to enhance productivity and the validity of research.

Taking the basic principles of research, consider how the use of statistics strengthens the work: Research that would be objective must employ methods explainable to others and observable in nonsubjective language. It requires precision in planning, procedures, and interpretation. It invites critical scrutiny by all who are interested in what is being investigated. Therefore, it is a public enterprise. Finally, it must represent a "What if?" attitude rather than a "That's final!" posture. Statistical methods, correctly used and wisely interpreted, help to make all of this possible. ☐

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Reader's Exchange: Self-Handicapping Alcohol Abuse

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Research Reports

Update: Genetics Research

In growing numbers, alcohol researchers expect the genetic code to provide the key that will unlock the mystery of why some drinkers become alcoholics while others don't. However, finding a single "alcoholic gene" is highly unlikely. This is not the objective, cautioned V. Gene Erwin, Ph.D., University of Colorado, addressing a May meeting of the American Association for the Advancement of Science meeting in Los Angeles.

Concurring with this opinion, David Goldman, M.D., chief of the genetics unit in NIAAA's Intramural Research Laboratory, adds that the heritable component in alcoholism is undoubtedly "multifactorial." Goldman describes his research in a June session of the ADAMHA Research Forum in Rockville, MD.

As presented in the AAAS and ADAMHA sessions, the story of the genetic approach in NIAAA-sponsored research is almost literally a tale of men, mice, and molecules. The scope of this effort ranges from whole famillies to segments of DNA.

A multifaceted approach is inevitable, Marc Schuckit, M.D., San Diego Veterans' Administration Medical Center, told the AAAS audience, because human alcoholism is "a multidimensional problem." But the results of studies involving families, twins, and adoptees with this problem have convinced him that "genetic factors in alcoholism are significant."

In his own research, Schuckit uses various psychological and hormonal measures to test the reactions of healthy, nonalcoholic Caucasian young men to three dose levels of alcohol. His main finding is that men from families with a history of alcoholism are less affected, especially by a low dose, that their counterparts for alcoholism-negative families. Schuckit doesn't know whether this difference in reactions to alcohol is a predictor of alcoholism. Longitudinal studies would be needed to answer this question.

Some investigators emphasize research with male subjects because, according to epidemiologic studies, male alcoholics outnumber female alcoholics by about three to one. This ratio was cited by Robin Cotton, Ph.D., a staff fellow in NIAAA's Intramural Research Laboratory, as an important reason for choosing to study the y chromosome, which may carry genetic markers for alcoholism as well as for maleness. Working with cloned cell lines from a population of male alcoholics, Cotton will be using y-specific DNA fragments to look for an association with the high-risk male population.

Cotton also has been using recombinant DNA techniques to determine where genetic markers for alcohol dehydrogenase (ADH) occur on chromosome 4. ADH is the principal enzyme that the human liver uses to metabolize alcohol. It occurs in 20 different forms in humans and other animals.

Boris Tabakoff, Ph.D., director of NIAAA's Division of Intramural Clinical and Biomedical Research, told the ADAMHA audience that the significance of these gene-mapping studies extends far beyond their relevance to alcoholism. They also "add a lot of general knowledge of how this genomic material is controlled," he said. For example, genes for making ADH presumably exist in brain tissue but are not expressed there. A central question for understanding alcoholism as well as other diseases is how the expression of an undesirable gene is "turned off."

Working at a different molecular level, Goldman is concentrating on genetic markers expressed as protein polymorphisms—that is, proteins that take different forms in different strains of animals or even in different individuals of the same strain. He is following up on NIAAA-supported research projects in which alcohol-related behaviors in inbred mice have been studied as behavioral markers. He assumes that a mouse strain prone to withdrawal seizures, for example, will have protein variants that differ from those in a strain that is seizure-resistant. If so, an alcohol-related behavior pattern can eventually be lined with a genetic marker.

Goldman has, in fact, found a locus in brain tissue of seizure-resistant mice where genetic fixation appears to have occurred after five generations of selective breeding. "So," he said, "we think that there's a high probability that this locus is involved in withdrawn seizure sensitivity and resistance." He is now trying to confirm this hypothesis.

Brains also provided the research context for two presentations at the AAAS meeting, one by Floyd Bloom, M.D., Scripps Clinic and Research Foundation, the other by Henri Begleiter, Ph.D., SUNY-Downstate Medical Center.

Bloom used rats to investigate cellular and synaptic events that may underlie psychoactive effects of ethanol. He cited previous studies with mice that had shown the cerebellum—particularly the Purkinje cells—to be differentially sensitive in animals bred for behavioral differences.

In Bloom's experiments, he found ethanol-specific responses in other brain loci: the climbing fibers of the cerebellum (which show a dose-dependent increase in firing rate), the inferior olivary nucleus (where neurons that send climbing fibers to the cerebellum also increase their firing rate after a dose of ethanol), and the nucleus locus coeruleus (where low doses of ethanol disrupt the regular firing pattern in neurons that send norepinephrine-containing fibers to the cerebellum).

At the whole-brain level, Begleiter is a pioneer in studies directed toward finding externally recorded electrophysiological markers than can be used to identify individuals who are at high risk to develop alcoholism. Using button-like electrodes pasted to the scalp, he monitors nerve impulses (potentials) of the brain that occur in response to stimuli the subject sees or hears. In these event-related potentials (ERPs) of his subjects, he has focused on two particular features, (1) a specific peak (Wave V) in brain waves evoked by auditory stimuli and (2) the P_3 component of brain waves evoked by attention to visual stimuli. This feature of the ERP is the third positive-charge peak in the brain wave and may denote an attention factor in the neural response.

Two sets of Begleiter's findings were highlighted at the AAAS meeting. First, in adult alcoholic males who had recently abstained from alcohol, he found the Wave V significantly delayed; but he established that this particular evoked potential normalizes after about 3 months of abstinence. In contrast, the P_3 doesn't normalize in 2 to 5 years of alcohol abstinence. Begleiter interprets this difference in ERP recovery as meaning that the pontine formation of the brain stem (which is involved in processing auditory input) eventually recovers after chronic alcoholism ceases, whereas the alcoholic's hippocampus (which, Begleiter believes, may be the source of the P_3 response) remains abnormal.

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Begleiter then asked, "Does the P_3 deficit *precede* alcoholism?" To answer this question, he compared the evoked brain waves of two groups of black, inner-city boys averaging about 12 years of age. The high-risk group had alcoholic fathers; the low-risks group came from families with no history of alcohol abuse. Measuring brain activity in several ways, Begleiter found the P_3 wave was the only component that differentiated high-risk from low-risk subjects. In other words, the brains of young sons of alcoholics appeared to behave like the brains of recovered alcoholics. He and his colleagues are counting the search for electrophysiological markers that may aid early identification of individuals likely to become alcoholics.

A different objective has motivated Erwin's research. Long involved in studying genetically determined sensitivity to alcohol in mice, he has adapted the animal model to an ongoing study of individual differences in human responses to alcohol. His hypothesis is that difference in sensitivity to alcohol have a genetic basis in humans as well as in mice.

Not willing to extrapolate hastily from mice to men, Erwin has begun research that will take about 2 more years to complete. Both male and female subjects are being tested individually on several behavioral and physiological measures at blood alcohol concentrations of zero and 0.1g/dl. Thus far, data have been collected on more than 200 subjects, all of whom are pairs related in some way—twins, nontwin siblings, or adoptees. The goal is to test 450 subjects and then conduct behavioral genetic analyses. Erwin's plan also includes followup with questionnaires and other methods for keeping track of his subjects.

Concluding the AAAS session, Sam Guzé, M.D., Washington University School of Medicine, advocated an increased emphasis on prevention. He also urged educators of health professionals to teach their students to look for cues that identify alcohol problems in their patients when diagnosing other illnesses. Researchers taking the genetics road are hoping that their findings will help to pave the way for such improvements in diagnosis.

—*Dorothy T. Moore*

New Adult Child of Alcoholic Pamphlet from Al-Anon

Al-Anon Family Group Headquarters has made available reprint from its book, *Al-Anon Faces Alcoholism*. The reprint, entitled *The Process of Recovery: Al-Anon and the Adult Child*, was written by Claudia Black, M.S.W., Ph.D. The reprint discusses characteristic emotional problems of many adults raised in alcoholic households, such as difficulties in trusting, identifying feelings, and establishing intimacy. Al-Anon adult child meetings are described as particularly useful recovery resources for the adult child in that they provide a safe, accepting environment for honest sharing of feelings.

The reprint includes guidelines for therapists to use in making referrals to meetings of adult children of alcoholics as well as suggestions for dealing with frequent objections raised by clients to attending these meetings or other Al-Anon groups.

Single copies are 10 cents each and bulk discounts are available. For further information contact Al-Anon Family Group Headquarters, Inc., Box 182, Madison Square Station, New York, NY 10159-0182.

—*Thomas Prugh*

Al-Anon/Alateen Survey

Al-Anon released the results of the first survey of membership groups in the United States and Canada. A random sample of 3 percent of all the groups was selected for polling. Sixty-seven percent of the selected groups responded. Among the findings:

- — Eighty-eight percent of Al-Anon members are female. Seventy-one percent have been members for at least 1 year, 30 percent for at least 5 years.
- — Al-Anon respondents averaged 43.6 years of age, Alateen members 14 years.
- — Most Al-Anon respondents—72 percent of the women and 58 percent of the men—were married at the time of the survey.
- — Forty-nine percent of all respondents had had some college education, and most were employed.
- — Nearly one-half of Al-Anon members and about one-third of Alateen members had received outside counseling or treatment.

More detailed information from the survey can be obtained by contacting the CPC Coordinator, Al-Anon Family Group Headquarters, Inc., Box 182, Madison Square Station, New York, NY 10159-0182.

—*Thomas Prugh*

Bar Association Endorses Youth Drug and Alcohol Prevention Program

At its 1985 meeting in Washington, DC, the American Bar Association's (ABA) House of Delegates approved a resolution supporting a series of legal, prevention, education, and treatment measures for reducing alcohol and drug problems among young people. The 20-point package was sponsored by the association's Section of Individual Rights and Responsibilities and its Advisory Commission on Youth Alcohol and Drug Problems, chaired by attorney David G. Evans, Chief, New Jersey Intoxicated Driver and Criminal Justice Programs.

The Advisory Commission held field hearings and collected the testimony of more than 160 witnesses in compiling a 130-page report (available to the public) to accompany the ABA recommendations. Among the recommendations are:

- Making age 21 the legal minimum for purchase or public possession of alcoholic beverages throughout the United States, including military bases;
- Opposition to alcohol advertising aimed at young people and to promotional strategies designed for college campuses;
- Legally mandated private and public health insurance coverage for the treatment of alcohol and drug problems;
- Encouraging State-level legislation to permit the filing of lawsuits against anyone serving alcohol to guest or customer under 21 who becomes intoxicated and later causes injury.

News Notes

The resolution makes no specific provision for funding any of the recommendations. It suggests, however, that "all possible revenue sources and methods to raise such funds" be investigated.

The Advisory Commission is working with State and local bar associations and with alcohol and drug abuse prevention organizations to develop support for the measures. Regional conferences are planned to build networks between lawyers and alcohol and drug abuse professionals.

For more information, contact Ellen S. Teller, Project Consultant, American Bar Association Advisory Commission on Youth Alcohol and Drug Problems, 1800 M Street NW., South Lobby 200, Washington, DC 20036

—*Thomas Prugh*

Alcohol and Hunting Safety

As part of a comprehensive recreational safety effort, the State of Kansas has developed an education program called "Know Your Limit" that is aimed at reducing the incidence of alcohol-related hunting accidents. A joint effort of the State's Alcohol and Drug Abuse Services and the Kansas Fish and Game Commission, the project is expected to reach as many as 15,000 young people and several thousand adults this year alone. Anyone who was born after 1956 and who wants to hunt is required to attend a safety clinic. Children attending the clinic must be accompanied by an adult. Successful completion of the clinic entitles each participant to a "Kansas Safe Hunter" card, which is the equivalent of a hunting license for those under 16 years of age.

The clinics and supplemental written materials present information concerning the physiological effects of alcohol, common myths about drinking, peer pressure, and the importance of positive adult role models. Special attention is given to the effects of alcohol on color vision, peripheral vision, and other functions of particular relevance to hunters.

For further information, contact Cynthia Shaffer, c/o Kansas Continuum, 2700 West Sixth Street, Biddle Building, Topeka, KS 66606

—*Thomas Prugh*

PACT: Program for Alcohol Consultation and Treatment

The Rutgers University Center of Alcohol Studies has joined with St. Peter's Medical Center, a teaching affiliate of the University of Medicine and Dentistry of New Jersey/Rutgers Medical School, to operate a combined alcoholism research and clinical treatment program. Directed by Barbara S. McCrady, Ph.D., PACT will emphasize treatment efficacy studies and early identification of alcoholics.

The working philosophy of the program is that alcohol abuse and dependence are multifaceted disorders that include biological, learning, and environmental factors, according to McCrady. Research efforts will be focused on improving outpatient treatment and on motivating alcoholics to seek treatment. At the same time, the program is expected to educate medical professionals in the early identification and appropriate referral of alcohol-abusing patients.

For further information, contact Eileen Lawton, Vice President for Community Relations, St. Peter's Medical Center, 254 Easton Avenue, New Brunswick, NJ 08903.

—*Thomas Prugh*

Anesthetists Support Group Formed

A support and advocacy group has been formed for anesthetists who have had problems with alcohol or other addicting drugs. The purpose of Anesthetists in Recovery (AIR) is to maintain a cooperative network of anesthetists who can provide education, intervention, evaluation, referral, and reentry service to peers. AIR welcomes members from all health professions involved in the administration of anesthesia. Services are free and confidentiality is strictly assured.

AIR publishes a newsletter and has contact in most States. For more information, contact Beth Visintine, CRNA, 5626 Preston Oaks Road, Unit 40D, Dallas, TX 75240.

—*Thomas Prugh*

Safety Update

Drinking Age Issues Examined

In 1984, President Reagan signed into law a bill (the Uniform Minimum Drinking Age Act) designed to encourage the States to adopt age 21 as the legal drinking minimum by withholding highway construction funds from States that had declined to enact such legislation. The National Highway Traffic Safety Administration (NHTSA) has since issued a booklet entitled "Drinking Age 21: Facts, Myths, and Fictions" that recaps many of the arguments made by opponents of the 21-year drinking age. Eighteen frequently heard arguments are presented and rebutted. A selection of the arguments and counterarguments is excerpted or summarized below.

Argument: At 18, young adults are old enough to fight and die for their country. Shouldn't they be considered old enough to drink beer?

Rebuttal: "The problem . . . becomes most acute when society demands that an individual carry out some civic *responsibility* . . . while denying that same individual a *right* . . . But is this really inconsistent? Isn't it logical to say that an 18-year-old may be sufficiently mature to carry out his or her service obligation, but may not yet be ready to handle drinking responsibly? After all, young people entering military service receive extensive training by experts, and live in a well-regulated and disciplined environment."

Argument: The research on the effects of the drinking age 21 law is too ambiguous at present to justify mandating it nationwide.

Rebuttal: In the vast majority of cases, information about the role of alcohol in accidents is simply unavailable. "A well-accepted research method for overcoming the lack of information is to analyze the frequency of night-time, single-vehicle crashes involving male drivers. . . . It has been shown that those kinds of crashes usually *do* involve alcohol: as much as 65 percent of the time or more. Thus, if some action (such as a drinking age 21 law) is affecting the frequency of alcohol-related crashes, the impact of that action is likely to show up in an examination of those night-time, single-vehicle, male-driver crashes.

Occupational Arena

"Among those States that have raised the drinking age to 21, there has been an average reduction of 28 percent in nighttime fatal crashes involving vehicles driven by drivers of the affected ages."

Argument: Even if the drinking age were raised to 21, teenagers would still be able to get alcohol.

Rebuttal: "Certainly, no regulation works perfectly. . . . The current lower drinking age isn't foolproof, either. Setting the age higher will help to stem the 'trickle down' of alcohol to those lower age groups."

"Although this type of regulation isn't perfect, it *does work* to some degree. . . . One reason . . . is that most people are reasonably law-abiding. And, the law can have positive 'spinoffs' that will help to make it more effective. For example, the law will influence many parents to regulate the alcohol consumption of their children aged 18–20 years."

The booklet is available from NHTSA, 400 Seventh Street, SW., Room 5130, Washington, DC 20590. There is no charge for single copies.

—Thomas Prugh

Conference Proceedings on Young Driver Accidents Available

The nonprofit Traffic Injury Research Foundation of Canada has released the proceedings of a symposium held late in 1983 on young driver accidents. Included in the 191-page volume are eight papers on related topics, including the scope of the problem in North America and elsewhere; analyses of young-adult-driver risk factors; issues of responsibility; suggestion for improving driver education; and the influence of drinking patterns, practices, and attitudes on youthful driving behavior.

"Young Driver Accidents: In Search of Solutions" also contains summaries of working group discussions of the papers, suggestions for action, and a brief account of related activity since the symposium. Inquiries or orders should be directed to Publications, Traffic Injury Research Foundation of Canada, 171 Nepean Street, Ottawa, Ontario, Canada K2P 0B4.

—Thomas Prugh

Westinghouse EAP Adopt-A-School Program

In Baltimore, an employee assistance program (EAP) run by Westinghouse Corporation's Defense and Electronics Center is lending its expertise to local schools to assist them in their efforts to curb student drug and alcohol abuse. The drug and alcohol program is one of several ways in which Westinghouse is collaborating with the Baltimore Board of Education to enhance school operations, according to James O'Hair, senior counselor for the EAP. At one inner-city school in particular—Harlem Park Junior High—the company EAP has installed computers and arranged for instruction in their use; taught classes in the fundamentals of business; developed an introductory engineering course for science students; helped to set up a school newspaper; and started a lacrosse team—undoubtedly one of the few inner-city, junior high teams in the country. Why lacrosse? "By offering a minor sport like that, the students open themselves up to the possibility of scholarships to some of the better colleges," says O'Hair.

Westinghouse's EAP has concentrated on drug and alcohol projects. Beginning in November 1984, the program assembled an advisory and planning committee consisting of representatives from Harlem Park faculty and administration, the Maryland Alcoholism Control Administration, the Mayor's Office of Prevention, the Baltimore County Alcohol and Drug Program, local community agencies, and the student body.

Several months of planning and preparation by the committee, together with the work of 75 students, culminated in a half-day event staged for the entire school. As the students arrived in the auditorium, each was given a "Just Say No" button, courtesy of the National Institute on Drug Abuse. They were then treated to a film and a series of student-acted skits dramatizing drug and alcohol messages and modeling decisionmaking and peer pressure scenarios. Speakers were heard as well, including Mike Young of the Baltimore Orioles and a Baltimore city policeman who detailed—from professional experience—some of the grimmer consequences of drug and alcohol abuse.

The success of this event has stimulated a desire to pursue longer-term projects. Further progress depends to some extent on mobilizing grassroots support from parents and the community, but O'Hair believes that people are both aware of and tired of the drug trafficking in the area and that this frustration can be harnessed to good effect. If so, and if adequate financial support can be found, the committee hopes to develop a student assistance program along EAP lines. There also are plans to stage a 2-day inservice training session on chemical abuse for all Harlem Park faculty.

O'Hair is optimistic and says, "We see schools as the training ground for future employees—and the better the educational process, the better the employee. The specific relationship—that EAPs can help to establish programs to identify problems in their early stages, to work with students and families in recognizing serious alcohol and drug problems and doing something about them—has real potential for the future."

For additional information, contact James O'Hair, Senior Counselor, Westinghouse DEC, Employee Assistance Program, PO Box 746 (MS 1163), Baltimore, MD 21203.

—Thomas Prugh

ADM/Workplace Research Under Way

The National Institute on Alcohol Abuse and Alcoholism recently awarded research grants to three University of Michigan investigators to carry out studies of alcohol, drug, and mental health (ADM) problems in the workplace. All three projects are currently in progress; the most extensive one is scheduled for completion in 1987.

Andrea Foote, Ph.D., is studying the effect of routine, periodic followup contact on the course of recovery in EAP clients. As many as 450 EAP-referred employees of a large manufacturing firm will be assessed, treated, and then assigned to an experimental or a control group. Experimental group members will have regular contact with an EAP counselor, whereas control group members will see the counselor only as events require. The study will follow all clients for 2 years after entry into the program. Data will be

Occupational Arena

collected on workplace performance and absenteeism, health benefit utilization, hospitalization episodes, relapses, and clients' subjective impressions. In addition to assessing how regular support and guidance affect recovery, the study may make it possible to identify factors useful in predicting which clients in particular might benefit from such contact.

A second study, directed by Barbara Israel, M.P.H., is designed to explore the value of employee participation in management decisionmaking as a means of reducing or changing sources of stress and bolstering workers' coping abilities. The setting is a rural automotive parts manufacturing plant. This 3-year effort will employ interviews, record and document review, and participant observation to gather data on the value of formal employee participation programs and employee problem-solving groups in ameliorating stress.

Paul Wortman, Ph.D., is principal investigator for a study with three aims: (1) to develop a quantitative method for analyzing what is known about the links between occupational stress and ADM problems; (2) to determine which risk factors are most closely associated with problems; and (3) to use this knowledge to suggest promising intervention strategies. Wortman and his colleagues will be looking at particular types of stress factors and at modifying variables such as personal and situational characteristics.

For further information, contact Donald F. Godwin, Associate Director for Occupational Programs, National Centers and Special Programs Branch, Division of Extramural Research, National Institute on Alcohol Abuse and Alcoholism, 5600 Fishers Lane, Room 14C–20, Rockville, MD 20857.

—*Thomas Prugh*

Next Issue

An estimated 2 to 4 percent of all cancer deaths in the United States are related to alcohol and the Spring 1986 issue of *Alcohol Health and Research World* examines this link.

Although there is insufficient evidence to suggest that alcohol is directly carcinogenic, some alcoholic beverages may contain cancer causing substances. Alcohol also may act as a cocarcinogen by promoting the carcinogenic qualities of other substances.

The issue includes reports from investigators in the field that present evidence for associations between chronic alcohol consumption and cancers of the mouth, pharynx, larynx, and esophagus. In addition, articles discuss the role alcohol may play in cancers of the liver, pancreas, stomach, large intestine, rectum, breast and malignant melanoma.

Of course, we'll also have our regular departments, an epidemiologic bulletin and other research reports.

Reader's Exchange: Use of Family Treatment Methods

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Conclusion

The data from this survey offer the general impression that services to families of alcoholics, as well as to the alcoholics themselves, are widespread and are seen as beneficial for both the alcoholic and the family. Such services are offered to the family during inpatient and outpatient phases of the alcoholic's treatment. They differ widely, however, in their mode of service to the family, in treatment goals and methods, and in the extent to which the family members are served. Further research is needed to identify the relative efficacy of the varying modes of family treatment and to assess the results of each of these for the family and for the alcoholic patient. ☐

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For more information, contact Curtis Janzen, Ph.D., 525 West Redwood Street, Baltimore, MD 20201.

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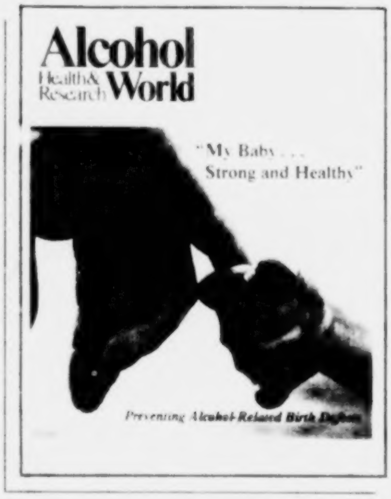
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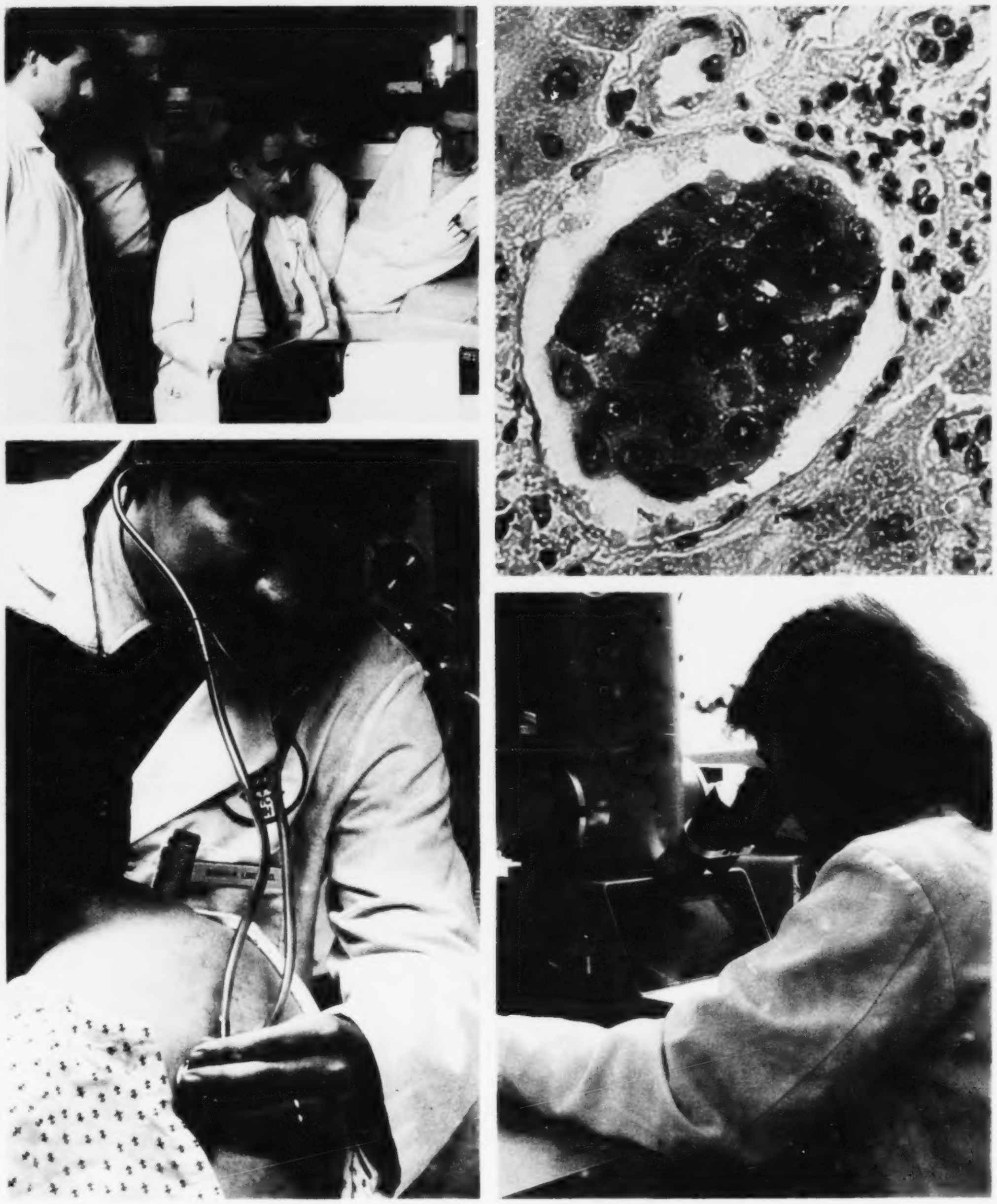

ALCOHOL and CANCER

U.S. Department of Health and Human Services

Public Health Service

Alcohol, Drug Abuse, and Mental Health Administration

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From the Editor

For the majority of Americans, each of the human body's 100 trillion cells will live and die with seemingly purposeful orchestration and will be unaffected by the abnormal and uncontrolled growth patterns characteristic of cancer.

Nevertheless, 930,000 people will be diagnosed as having cancer this year. About 472,000 people will die of cancer in 1986, according to the American Cancer Society. Of those, between 9,440 and 18,880 (an estimated 2 to 4 percent of all cancer deaths) will be related to alcohol.

Although there is insufficient evidence to suggest that alcohol is directly carcinogenic, alcoholic beverages may contain cancer-causing contaminants. There is also strong evidence that alcohol may be a cocarcinogen, a substance that has the effect of promoting the carcinogenic qualities of other substances such as tobacco smoke. In fact, the cancer risk associated with alcohol appears to be greatest when the drinker also smokes. Because chronic heavy drinkers often consume as much as 50 percent of their daily calories as alcohol, poor nutrition may also contribute to the development of alcohol-related cancers.

But by limiting one's exposure to the so-called avoidable risk factors—such as alcohol or tobacco—a person can exercise significant personal control over his or her chances of getting certain types of cancer.

The articles that follow survey investigations conducted on the link between alcohol and cancer, describe possible underlying mechanisms by which alcohol may be associated with cancer, and provide a discussion of prevention strategies.

We hope that the information presented herein will provide the impetus for all health and helping professionals—from those involved in alcohol counseling and treatment to primary care physicians—to examine ways in which they can incorporate alcohol and cancer prevention education in their interactions with patients and clients.

—*Doug M. Podolsky*

Alcohol Health & Research World

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Alcohol Health and Research World (ISSN 0090-838X) is a quarterly produced by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) through the National Clearinghouse for Alcohol Information, operated under contract number ADM 281-84-0005 by InterAmerica Research Associates. Terry Freeman is the Project Officer for the Clearinghouse. The Secretary of Health and Human Services has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through September 30, 1986. Opinions expressed in contributed articles do not necessarily reflect the views of NIAAA. The U.S. Government does not endorse or favor any specific commercial product or commodity. Trade or proprietary names appearing in this publication are used only because they are considered essential in the context of the studies reported herein. Manuscripts concerning research, treatment, or prevention of alcoholism and alcohol problems are solicited and should be sent to the Editor, *Alcohol Health and Research World*, P.O. Box 2345, Rockville, Maryland 20852. Subscriptions and changes of address should be sent to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscriptions are $12.00 a year or $15.00 if mailed to a foreign address. Single copies are available at $3.25 ($4.06 to a foreign address). These prices are subject to change without notice. Unless otherwise noted in the text, all material appearing in this magazine is in the public domain and may be reproduced or copied without permission. Citation of the source is appreciated.

Alcohol Health & Research World

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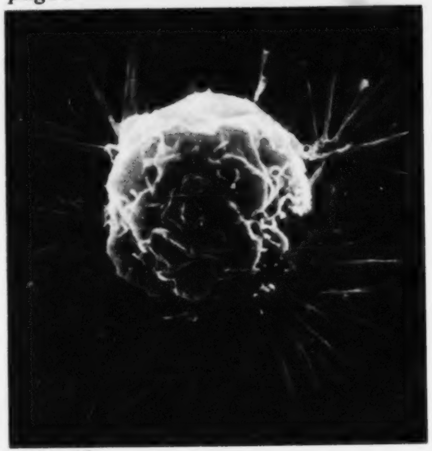

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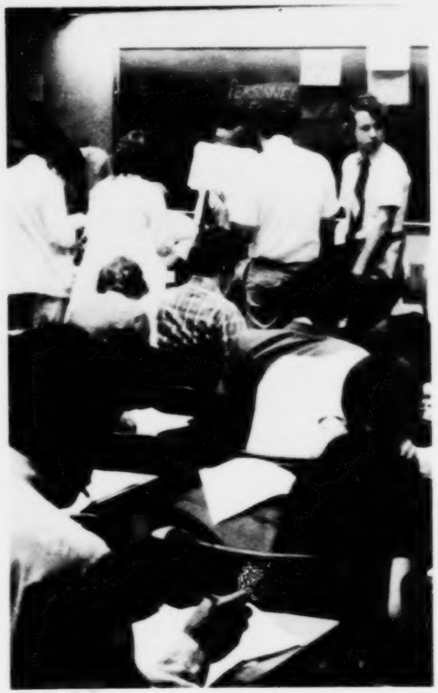

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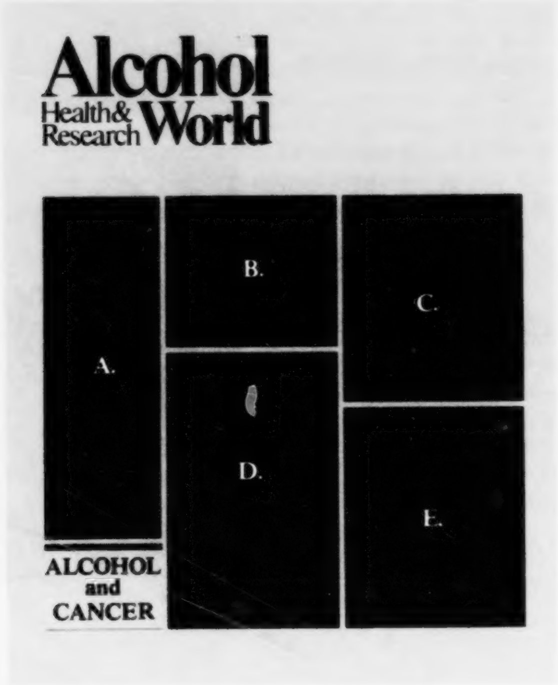

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A. The body's circulatory system. Photo courtesy of Richard Rush Studio.

B. Charles S. Lieber, M.D. (seated), and colleagues at the NIAAA Alcohol Research Center at the Mount Sinai School of Medicine (CUNY) and Bronx Veterans' Administration Medical Center. Photo courtesy of Mount Sinai School of Medicine (CUNY) and Bronx VA Medical Center.

C. A cluster of breast cancer cells. Photo courtesy of National Institutes of Health (NIH).

D. A physician at the NIH Clinical Center in Bethesda, MD, examines a cancer patient undergoing treatment. Photo courtesy of National Cancer Institute.

E. A researcher uses electron microscopy in studies on alcohol and cancer. Photo courtesy of Mount Sinai School of Medicine (CUNY) and the Bronx VA Medical Center.

Alcohol and Cancer

Perhaps the earliest clinical observation associating chronic alcohol consumption with cancer was made by J.C. Warren, a noted Boston surgeon who, in 1836, wrote that a case of lingual cancer ". . . was generated by the long use of ardent spirits" (cited in McCoy and Wynder 1979).

More than 75 years later, the French physician Lamy observed a relationship between the chronic consumption of alcohol and the development of cancer of the esophagus in his patients who drank absinthe—a green bitter liqueur with the flavor of wormwood and anise.

But it was not until the 1950s, when Ernst L. Wynder, M.D., and colleagues described an independent association of alcohol use with cancer of the esophagus, larynx, and oral cavity in case-control studies (Wynder et al. 1956, 1957), that other investigators began to look seriously at the relationship between cancer and alcohol use (Keller and Terris 1965; Martinez 1969; Vincent and Marchetta 1963; Tuyns et al. 1977; Williams and Horm 1977).

Through hundreds of studies that have been conducted in recent years, substantial evidence has been gathered that chronic or excessive alcohol consumption increases the risk of certain types of cancer in humans. Though the exact role alcohol plays in carcinogenesis is not fully understood, many hypotheses have been advanced to explain the alcohol-related mechanism of causation in many types of cancer.

Photo courtesy of the National Cancer Institute

A physician at the NIH Clinical Center in Bethesda, MD, examines a cancer patient undergoing treatment.

Though data from animal studies do not show clearly that alcohol by itself is carcinogenic, some investigations suggest that alcohol may act to initiate or promote carcinogenesis (see article beginning on page 10). Today, it is widely accepted that heavy alcohol consumption is a risk factor for the development of many types of cancer (National Cancer Institute 1984; USDHHS 1983).

In recent years, the list of cancers for which alcohol may play at least an associative role has grown and now includes the mouth, pharynx, larynx, esophagus, liver, pancreas, stomach, thyroid, and colorectal cancers. Investigators have also reported associations between alcohol consumption and increased risk for malignant melanoma and cancer of the breast (Rosenberg et al. 1982; Williams and Horm 1977). In fact, it has been estimated that consumption of alcoholic beverages—which contain congeners such as flavorings, chemical compounds, or contaminants produced during fermentation—is associated, either alone or in conjunction with other substances such as tobacco, with approximately 3 percent of all cancer deaths that occur in the United States each year (Doll and Peto 1981). Using 1974 figures, Rothman and colleagues (1980) estimated that about 11,100 of the 365,532 cases of cancer included in their study were attributable to alcohol.

About 930,000 people will be diagnosed as having cancer this year and approximately 472,000 will die of cancer in 1986, according to an American Cancer Society (1986) forecast. Of these cancer deaths, between 9,440 and 18,880 (an estimated 2 to 4 percent of all cancer deaths) will be related to alcohol.

Alcohol as a Risk Factor for Cancer

Although a precise mechanism of action in alcohol's role in the development of cancer has been elusive, the synergistic relationship between alcohol and tobacco in cancers of the oral cavity, pharynx, and larynx has been well documented (McCoy and Wynder 1979; Tuyns 1979, 1982). In one study (Phillips 1980), heavy smoking and drinking were estimated to increase the risk of oral cancer to as much as 15 times that of persons who neither smoked nor drank. Heavy smoking alone increased the risk two to three times. An attempt to explain the apparent synergy of alcohol and tobacco is reported by G. David McCoy of the Case Western Reserve University (see article beginning on page 28). The supposition is that the effect of alcohol consumption may be to increase the rate of metabolic activation of certain carcinogens in tobacco smoke. If so, this effect would increase the likelihood of some as yet unknown "critical alteration" within certain cells that could lead to the initiation of cancer, thus accounting for the apparent synergy of alcohol and tobacco usage.

For some alcohol abusers, alcoholic beverages account for 25 to 50 percent of their daily calories. Because alcoholic beverages are nearly devoid of essential amino acids, vitamins, and minerals, such a diet can result in serious nutritional deficiencies that may play a particularly important role in the development of certain alcohol-related cancers, especially of the liver and upper alimentary and respiratory tracts (Schottenfeld 1979). In fact, reports from different parts of the world suggest that populations suffering from malnutrition or alcohol-related nutritional imbalance, including vitamin A deficiency, have high rates of esophageal cancer (National Research Council 1982).

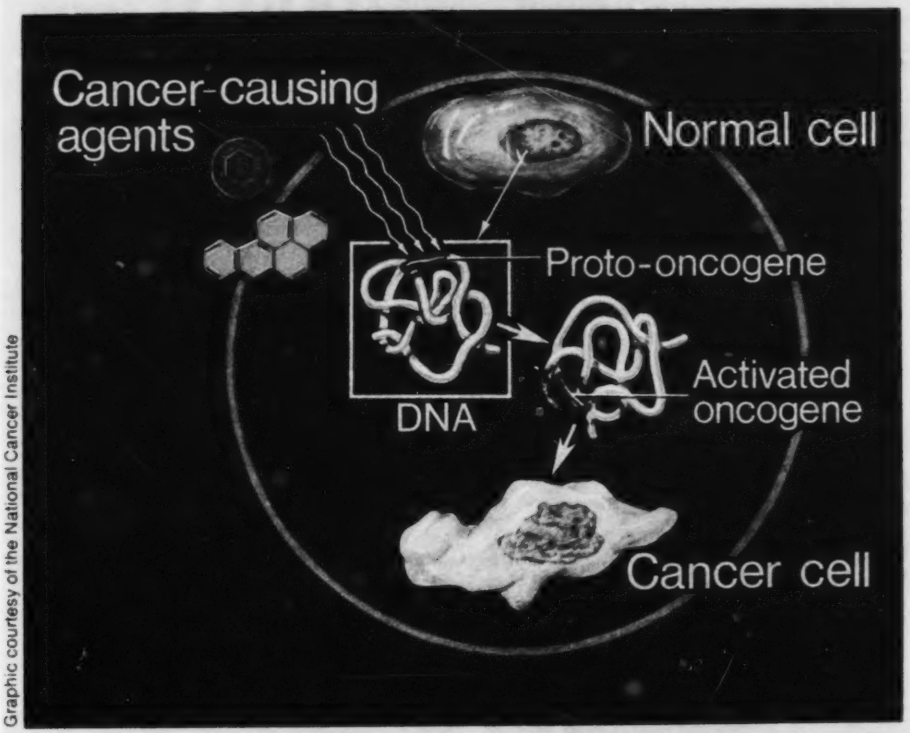
However, increased relative risk of developing certain cancers is by no means limited to the chronic alcohol abuser. Even a moderate amount of alcohol may increase one's risk for developing cancer (Rothman and Keller 1972). For example, in comparison with people who neither smoke nor drink, the cancer risk ratio is 2.43 for nondrinking heavy smokers and 3.24 for heavy smokers who drink less that one-half ounce per day.

Underlying Mechanisms

Although the exact role ethanol plays in the causation of cancers is unclear at this time (USDHEW 1981), numerous hypotheses have been developed to help explain possible underlying mechanisms by which alcohol may be involved in the development of cancers (NCI 1984). (For a full discussion of these mechanisms turn to the article on page 10.) Briefly, some of these hypotheses are as follows:

- Alcohol acts as a solvent, facilitating the transport of carcinogens across membranes. McCoy and Wynder (1979) point out that this is a working hypothesis for oral and esophageal cancers but not for cancer of the vo-

Continued on page 6



Graphic courtesy of the National Cancer Institute

A possible mechanism by which a normal cell is converted to a cancer cell

How Cancer Develops

Normally, the cells that make up the body reproduce themselves in an orderly manner so that worn-out tissues are replaced, injuries are repaired, and growth of the body proceeds.

Occasionally, certain cells undergo an abnormal change and begin a process of uncontrolled growth and may develop into masses of tissue called tumors—some benign and others malignant (cancerous).

The danger of cancer is that it invades and destroys normal tissue. At the beginning, cancer cells usually remain at their original site, and the cancer is said to be localized. Later, some cancer cells may invade neighboring organs or tissue. This occurs either by direct extension of the cancerous growth or by cancerous cells that become detached and are carried through the lymph or blood systems to other parts of the body. This is called metastasis of a cancer.

This spread may be regional—confined to one region of the body—when cells are trapped by lymph nodes. If left untreated, however, the cancer is likely to spread throughout the body. That condition is known as advanced cancer and usually results in death.

Because with each stage a case of cancer becomes progressively more serious, it is important to detect cancer as early as possible. The Seven Warning Signals of cancer can aid in early detection. These warning signals are:

- *A change in any bowel or bladder habit;*
- *A sore that does not heal;*
- *Any unusual bleeding or discharge;*
- *A thickening or lump in the breast or elsewhere in the body;*
- *Indigestion or difficulty in swallowing;*
- *An obvious change in a wart or mole; and*
- *A nagging cough or hoarseness.*

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Glossary

Editor's note: This glossary identifies and defines technical terms that appear in the following articles. Although these words are defined within each article when they first appear, we have provided this glossary as a further aid for our readers.

acetaldehyde the first product of ethanol metabolism

antibody a protein molecule that can recognize and bind to a specific antigen

antigen a substance that is capable of eliciting an immune response (antibody production) when introduced into the body

B-cell a lymphocyte that produces antibodies

bronchogenic carcinoma cancer originating in either of the two main branches of the bronchi

cancer a general term for about 100 diseases characterized by abnormal and uncontrolled growth of cells. The resulting mass, or tumor, can invade and destroy surrounding normal tissues. Cancer cells from the tumor can spread through the blood or lymph (the clear fluid that bathes body cells) to start new cancers in other parts of the body

carcinoma a malignant new growth made up of epithelial cells

carcinogen any cancer-causing substance

chromosomes threadlike elements within the nucleus of the cell that carry the hereditary factors (genes)

congeners the nonalcoholic components of alcoholic beverages

cytochrome P-450 a protein that preferentially metabolizes foreign compounds and can convert some of these, such as nitrosamines, into their carcinogenic forms in a process called metabolic activation

cytochrome P-450 dependent biotransformation system the enzyme system involved in the metabolism of drugs and the metabolic activation of many structurally diverse chemical carcinogens

cytoplasm the jellylike substance within a cell (exclusive of the nucleus) in which most chemical activity occurs

cytosolic retinol vitamin A (retinol) in the cellular component called cytoplasm

deoxyribonucleic acid (DNA) the genetic material in all mammals

differentiation the process whereby a cell becomes morphologically, developmentally, or physiologically specialized

epithelium tissue composed of contiguous cells that cover the internal and external surfaces of the body

etiologic pertaining to the cause of a disease

hematopoiesis formation and development of blood cells

hepatocellular carcinoma cancer affecting the liver cells

hepatotoxic toxic to the liver

hyperplasia an abnormal multiplication or increase in the number of normal cells in tissue

hypervitaminosis A a symptom complex resulting from ingestion of excessive amounts of vitamin A

leukocyte white blood cell produced in the bone marrow

lymph node rounded mass of tissue which serves as the main source of lymphocytes

lymphocyte a mononuclear white blood cell

lymphoreticular tumorigenesis production of new tissue growths from cells associated with the lymph nodes

lysosomes digestive organelles comprised of sacs of digestive enzymes found in many types of cells, but are especially abundant in the liver and kidney

malignant tending to become progressively worse and to result in death, said of some tumors

microsomes membranes in the cytoplasm of an active cell thought to be associated with production of certain proteins and the metabolism of foreign compounds through the cytochrome P-450 biotransformation system

mutagen an agent that induces genetic change

neoplasia formation of tumors or neoplasms

neoplasm a new and abnormal growth

nitrosamines organic compounds some of which show carcinogenic activity

nucleic bases biochemicals whose sequence within the double helix of DNA molecules forms the genetic blueprint that directs all cellular functions

0^6 MeG transferase an enzyme that can actually "repair" damaged portions of the DNA molecule

oncogenesis the production of tumors

potentiation the action of two drugs in which the combined effects are greater than the sum of the individual effects

procarcinogens a chemical substance that becomes carcinogenic only after it is altered by metabolic processes

proliferation the multiplication or reproduction of similar cells

retinol (vitamin A) the form of vitamin A found in mammals

retinol-binding protein (RBP) the protein that transports retinol into the plasma

sister chromatids the two spiral filaments that make up a chromosome

squamous metaplasia the transformation of normal cells into stratified, scaley, or platelike cells

synergy combined or cooperative action or force often greater than the sum of their individual actions or effects

T-cells white blood cells that can kill tumor cells

tumor a progressive and uncontrollable growth of tissue

xenobiotics chemicals foreign to the biologic system

Epidemiology Data Reported

Human consumption of alcoholic beverages has been linked epidemiologically to cancer of a variety of sites. In some cases, malignancies at specific sites seem associated with the excessive consumption of particular beverages. Associations have been noted between drinking in general and breast cancer (Rosenberg et al. 1982) and esophageal cancer (Breslow and Enstrom 1974). Observations of specific links have been published since the early years of this century: Lamy (1910, cited in National Research Council 1982) noted a connection between the heavy consumption of absinthe (a potent wormwood-flavored liqueur) and esophageal cancer.

In more recent studies, the drinking of homemade apple brandy is associated with esophageal cancer (Tuyns et al., cited in National Research Council 1982); beer

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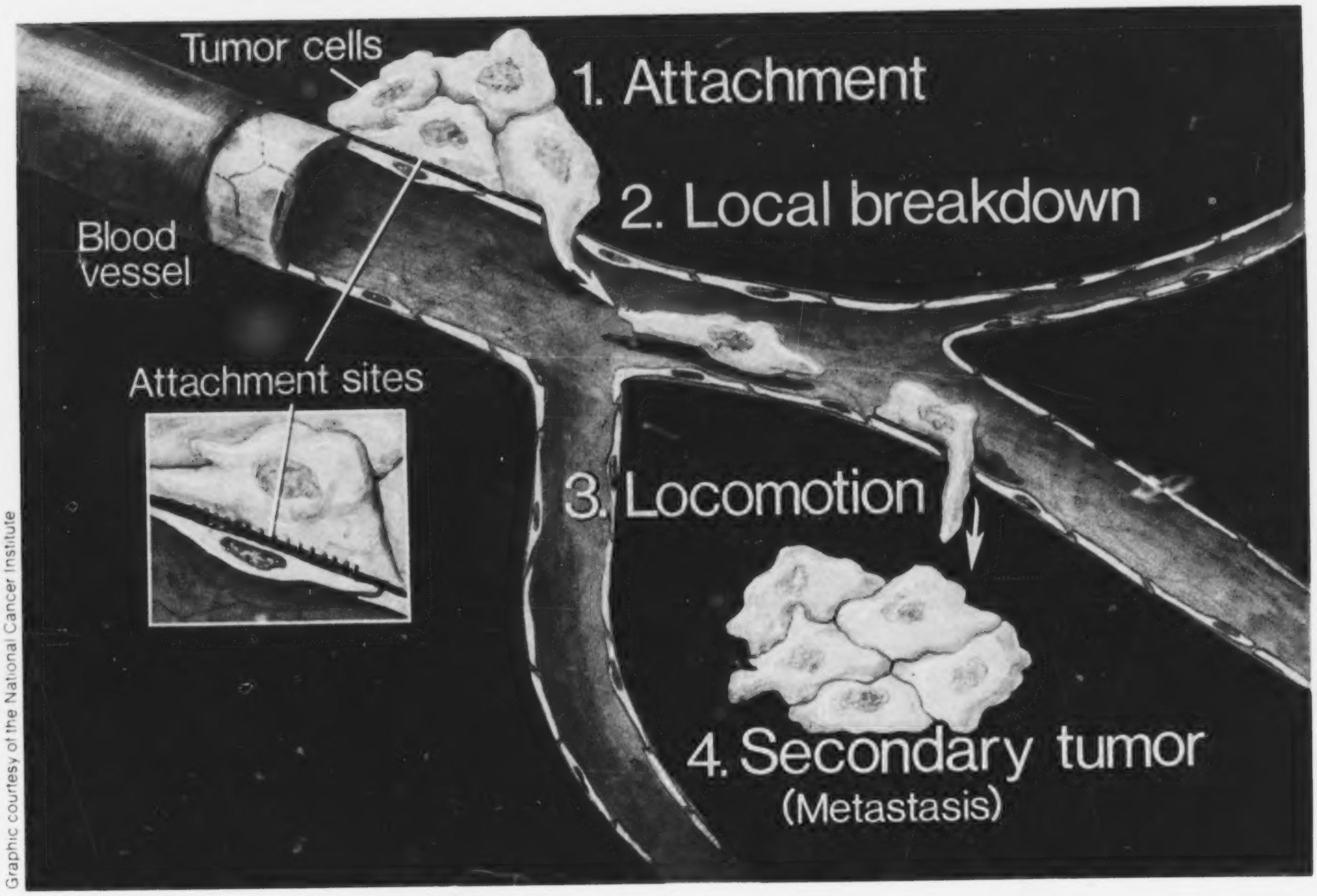
cal chords, with which alcohol does not come into direct contact.

- Because alcohol consumption damages cells of the liver, chronic drinking may interfere with this organ's repair processes. This interference might promote abnormal tissue growth by decreasing the liver's detoxification capability, thus exposing tissues to more carcinogens than would normally occur.
- Alcohol consumption leads to the induction in the liver of certain enzymes that metabolize chemical substances in the liver and convert them into carcinogenic substances.
- Certain alcoholic beverages may contain contaminants that may be carcinogenic. Such contaminants, which may be introduced accidentally or as part of the preparation of a particular beverage, include fusel oils, polycyclic aromatic hydrocarbons, nitrosamines, and asbestos fibers from filters.

Alcohol and Cancers of the Oral Cavity, Pharynx, and Larynx

The National Cancer Institute (NCI) reported 37,300 new cases of cancer of the buccal cavity (the inside of the mouth and lips), oropharynx, and larynx for 1982, about 34 percent (12,850) of which will be fatal. Estimates are that as many as 75 percent of these cancers were the result of the combined effects of chronic alcohol and tobacco consumption (Decker and Goldstein 1982). (NCI forecasts that 41,200 new cases of cancer of the buccal cavity, pharynx and larynx will be diagnosed this year and that there will be 13,200 deaths due to cancers of these sites in 1986.)

In recent years some studies have suggested that heavy drinking may be a greater risk factor than heavy smoking for developing and dying from certain cancers of the head and neck. Masherg and colleagues (1981) indicated that for someone who smokes and drinks, doubling alcohol consumption leads to a much greater risk of oral cancer than does doubling the cigarette consumption. Other investigators



Graphic courtesy of the National Cancer Institute

An artist's conception of the spread of cancer to a secondary site.

also have shown that, even with constant tobacco exposure, increasing levels of alcohol consumption can increase risk levels up to 15 times in heavy drinkers and smokers (Rothman and Keller 1972).

It has been proposed that the carcinogenic action in oral cancers might stem from direct contact of alcohol and tobacco with the oral cavity over a long period, with the alcohol acting as a solvent for tobacco-related carcinogens (Decker and Goldstein 1982; Feldman and Boxer 1979). In a similar hypothesis, alcohol is said to act as a solvent to increase the entry of carcinogens into cells (McCoy and Wynder 1979).

Still another hypothesis is based on the possibility that carcinogenesis might be associated with alcohol-related nutritional deficiencies (Decker and Goldstein 1982; McCoy et al. 1979). This theory is supported by the finding of an association between Plummer-Vinson syndrome (a condition characterized by chronic iron deficiency) and the development of cancer of the oral cavity, pharynx, and larynx.

Alcohol and Cancer of the Esophagus

The incidence of cancer of the esophagus varies widely throughout the world. In most developed countries of the West, it is low or moderate; but extremely high rates have been reported in parts of China, the Soviet Union, Iran, some African countries, an area of western France, and parts of the Caribbean (NCI 1984).

In some countries, high esophageal cancer rates were linked to consumption of strong, locally brewed alcoholic beverages (Tuyns 1982). In parts of China, for instance, esophageal cancer incidence has been associated with samshu, a Chinese rice wine combined with grain alcohol (deJong et al. 1974); in the Sudan, aragi, a distillate made from dates, has been incriminated in local cancer rates (Malik et al. 1976).

Other possible mechanisms of action include alcohol-related nutritional deficiencies of iron and riboflavin and the possibility that alcohol might interfere with the body's immunologic defenses (Lieber et al. 1979; McCoy et al. 1979; Schottenfeld 1979). It has also been suggested that chronic alcohol consumption might act directly on the esophageal mucosa, interfering with the normal function of the esophagus and increasing exposure to potential carcinogens (Wienbeck and Berges 1981).

Even if the mechanisms are unknown at this time, results of a study by Keller (1978) clearly suggest that alcohol consumption—especially of distilled spirits—increases one's relative risk of developing cancer of the esophagus. In a study comparing the relative risk rates of blacks and whites in Washington, DC, Pottern and colleagues (1981) found that black men there suffered esophageal cancer at a rate of 28.6 per 100,000 population, more than double the national rate for black men and seven times that of white men. Data from interviews and alcohol tax revenue files indicate that hard liquor consumption by black men in the Washington metropolitan area was much higher than the national average for blacks. Also, these data show, mortality rates from cirrhosis of the liver from 1965 to 1971 were 2.5 times the national rate for nonwhite males.

Alcohol and Cancer of the Stomach

Although stomach cancer rates have been declining in the United States for several years, stomach cancer still accounts for one of the most common types of tumors in Western countries (Tuyns 1982). Some studies have shown an association between drinking habits and stomach cancer, though the evidence is, at times, conflicting, particularly regarding the effect of alcohol on the gastric mucosa (Lieber et al. 1979).

Alcohol and Cancer of the Large Bowel

The relationship of beer consumption to colorectal cancer is still in question (Tuyns 1982). However, some international studies show a positive correlation between beer consumption and cancer of the rectum (McMichael et al. 1979).

A study of Guinness brewery workers, whose beer intake is exceptionally high, showed an increased risk of rectal cancer (Dean et al. 1979), but a 1979 study of some 14,000 Danish brewery workers by O.M. Jensen found no such link (Tuyns 1982).

The Suspected Role of Congeners

There seems little doubt that heavy drinking is significantly related to many kinds of malignancy (National Cancer Institute 1984). A puzzle in the relationship, however, is the fact that studies of laboratory animals have been unable to show that ethanol per se is carcinogenic (Tuyns 1982). There are also geographical areas, such as Iran, where alcohol consumption is negligible; but the incidence of certain malignancies associated with alcohol is high. Humans, of course, do not drink pure alcohol, by and large; even the strongest libations (such as absinthe, which has an ethanol content as high as 68 percent) contain a variety of nonalcoholic components called congeners. Recent studies have focused on the possibility that some of the congeners and contaminants in alcoholic beverages

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Photo courtesy of the National Institutes of Health

A cluster of breast cancer cells is pictured as it spreads to the portal tract of the liver.

Photo by Bill Branson, NIH photographer

NIAAA investigators prepare cell lines for use in genetic studies.

Pointing out that rectal cancer rates are highest in areas where large amounts of dark beer are consumed, a *Lancet* editorial ("Beer and bowel cancer," 1980) suggested that the cause might be related to the alcohol, the type of beer, brewing techniques, or additives or contaminants in the beer.

Alcohol and Cancer of the Pancreas

Cancer of the pancreas has increased significantly during the past three decades (Okuda and Ohnishi 1981) and now accounts for about 20,000 deaths in the United States each year. It is the third most lethal form of cancer for men between the ages of 35 and 54 (MacMahon et al. 1981; Okuda and Ohnishi 1981).

Though the evidence is inconclusive, some studies have implicated alcohol as a causative agent in the development of pancreatic cancer (Okuda and Ohnishi 1981; Williams and Horm 1977). An association between alcoholism and cancer of the pancreas dates back to the retrospective study by Burch and Ansari (1968) in which 75 percent of the patients with pancreatic cancer also had a history of moderate to heavy alcohol intake. Additional support for this thesis was provided by the report that the risk of pancreatic cancer was twice as great for males who consumed alcohol daily as for males who were nondrinkers (Lieber 1977). Other investigators, however, have found no association between alcohol consumption and cancer of the pancreas (MacMahon et al. 1981).

Alcohol and Cancer of the Liver

Although primary liver cancer in Europe and North America accounts for fewer than 1 percent of all cancer deaths, in the developing nations of Asia and Africa it is one of the most common forms of cancer (NCI 1984).

Worldwide, between 60 and 90 percent of primary liver cancer in developing nations is associated with cirrhosis (Tuyns 1982). However, autopsy studies show that among all alcoholic cirrhotics, the proportion with liver cancer varies from 5 to 30 percent. The apparent discrepancy between the high expected incidence of liver cancer in alcoholic cirrhotics and the relatively low rates actually found at autopsy may be because many of these patients die of cirrhosis before cancer develops (Tuyns 1982). Or, liver tumors (hepatomas) may develop in the absence of cirrhosis (Lieber et al. 1979; Tuyns 1982).

The mechanism of how alcohol consumption actually plays a role in the causation of liver cancer is unclear. Hypotheses under study include the possibility that alcohol-induced microsomal enzyme systems may increase the metabolism of liver-specific carcinogens (Lieber et al. 1979; McCoy et al. 1979).

Other possible explanations are that repeated cell damage caused by chronic alcohol consumption promotes the development of tumors of the liver (Lieber et al. 1979), or that a single agent as yet unknown has both a cirrhotogenic and a carcinogenic effect (Tamburro and Lee 1981).

A strong association has also been demonstrated between hepatitis-B virus (HBV) and hepatocellular carcinoma (Yarrish et al. 1980). It may be that chronic hepatitis-B virus infection sensitizes patients to the hepatotoxic effects of alcohol, increasing the vulnerability of these patients to the development of cancer at this site (Cann 1984 unpublished).

Alcohol and Cancer of the Thyroid Gland

Interview data from the Third National Cancer Survey (Williams and Horm 1977) suggest that there may be an association between consuming a variety of alcoholic beverages and cancer of the thyroid gland. Results suggest that intake of wine, beer, and liquor are positively correlated with the development of new and abnormal growths originating from the thyroid gland (Williams and Horm 1977).

Alcohol and Cancer of the Breast

The suggestion that alcohol may increase the risk of breast cancer in women is comparatively new. Interview data from the Third National Cancer Survey showed a positive association between alcohol consumption and breast cancer (Williams and Horm 1977). In 1982, authors of a case-control study suggested that women who drink are 1.5 to 2 times as likely to develop breast cancer as women who do not drink (Rosenberg et al. 1982). However, this study did not measure the quantity of alcohol consumed or the length of time the women had been drinking, and no data were gathered on dietary habits that may have played a role in the development of the disease. (See article beginning on page 40 for a full discussion of the association between alcohol and breast cancer).

Conclusion

Evidence is growing for strong associations between chronic alcohol consumption and a variety of cancers. In addition, scientific investigators are assigning alcohol a role in the increased risk for certain malignancies. The articles that follow cover some of the latest information on underlying mechanisms for alcohol involvement in cancer, discuss new hypotheses that could help explain the alcohol-cancer association, and suggest strategies that could help in the prevention of this public health problem. ☐

—Doug M. Podolsky

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Continued on page 65

Mechanisms for the Interrelationship Between Alcohol and Cancer

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Maria A. Leo, M.D.
Theresa M. Worner, M.D.

Editor's note: *The following two articles describe research into the possible underlying mechanisms whereby alcohol abuse and alcohol-related diseases may promote the development of various cancers. The* articles have been edited for our readers. *Those in the research community who wish to receive more technical versions of these articles, or who wish to request more information, should contact Dr. Lieber at the Veterans' Administration Medical Center, Alcohol Research and Treatment Center, 130 West Kingsbridge Road, Bronx, NY 10468.*

An association between heavy drinking and certain types of cancer has been observed clinically for many years. In 1964, the World Health Organization surveyed the research on alcoholism and cancer and concluded that an association existed between excessive drinking of alcoholic beverages and cancer of the mouth, the larynx, and the esophagus (World Health Organization 1964). In a series of studies (Wynder and Bross 1957, Wynder et al. 1956*a*, 1956*b*, 1957*a*, 1957*b*), heavy drinkers were found to have a tenfold increase in risk of developing cancer of the mouth.

Subjects who drink excessively often are also heavy smokers. It appears that alcohol plays a more important role than smoking with respect to cancer of the esophagus, whereas smoking seems to be more strongly associated with cancer of the mouth and pharynx (Flamant et al. 1964). (For a detailed discussion of the association between smoking and alcohol in cancers, see the article beginning on page 28.)

Additional sites of cancer associated with alcohol abuse include, but are not limited to, the pancreas (Burch and Ansari 1968; Hirayama 1970; International Agency for Research on Cancer 1973), the cardia of the stomach (MacDonald 1972), and the colon (Williams and Horm 1977).

The Role of Congeners in the Development of Cancer

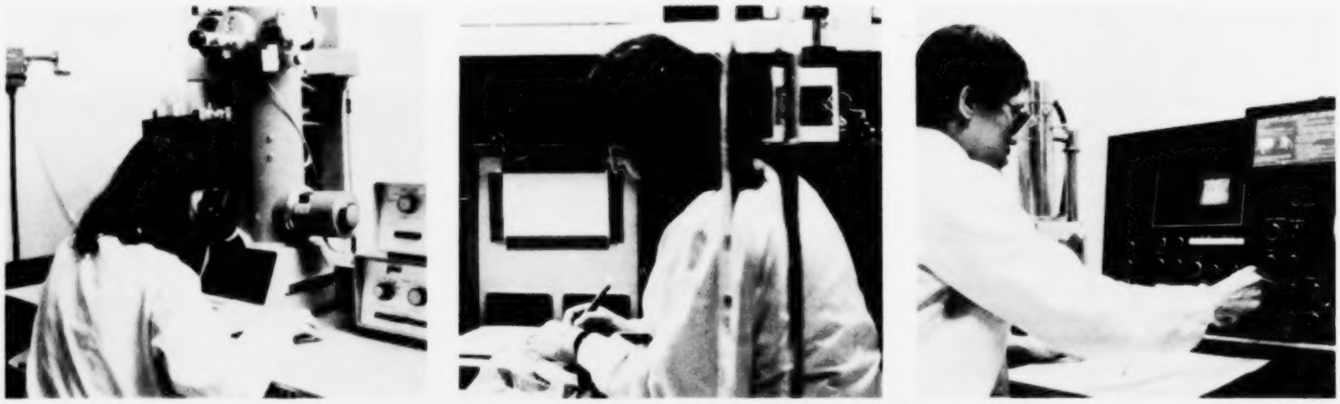
Precisely how cancers of the gastrointestinal tract are linked to alcohol is not known. One mechanism may be related to the tissue damage produced by the high local concentration of ethanol to which some of these tissues are subjected. In addition to the local effects of ethanol itself, some congeners—the nonalcoholic components of alcoholic beverages—may play an etiological role in the development of cancer. Indeed, esophageal cancer has been produced in animals by administering relatively large amounts of nitrosamines (organic compounds, some of which show carcinogenic activity) which are also found as congeners in some alcoholic beverages (Lijinsky and Epstein 1970; Lowenfels 1974). In addition, an increased incidence of esophageal cancer has been described in the alcoholic (Cook 1971; Tuyns 1970). Furthermore, the presence of ethanol seems to catalyze the production of nitrosamines from their constituent components, namely the nitrites and secondary amines, under conditions that are found in the upper gastrointestinal tract (Pignatelli et al. 1976). Certain locally prepared beverages peculiar to some geographic regions contain congeners that have, in several instances, been associated with increased cancer incidence. For instance, in France, the risk of esophageal cancer is particularly pronounced in alcoholics who drink apple brandy whiskey but is less apparent in those consuming beer or wine (Tuyns 1970). Similarly, in eastern and southern Africa, beverages derived from maize have been implicated as risk factors for esophageal carcinoma (Cook 1971).

Studies of brewery workers in Denmark (Jensen 1979) and Ireland (Dean et al. 1979) also support the possibility that carcinogens present in some alcoholic drinks contribute to the development of cancer. Both groups regularly consume large amounts of beer, but only the Irish brewery workers exhibit an increased risk of large bowel cancer. This was attributed to the fact that Danish beers have a significantly lower dimethylnitrosamine (DMN) content than Irish beers (Tuyns 1970). Whether the DMN is the actual carcinogen responsible for the increased bowel cancer incidence is still open to question, because there is no indication from animal studies that DMN can act as a bowel carcinogen. Still, a variety of carcinogens such as polycyclic hydrocarbons (phenanthrene, fluoranthrene, benzanthracene, benzopyrene, chrysens) also have been found in alcoholic beverages (Matsuda et al. 1966), and asbestos fibers (derived from filters) have been detected in beer, wine, sherry, and vermouth (Bignon et al. 1977; Biles and Emerson 1968; Cunningham and Pontetract 1971; Wehman and Plantholt 1974).

Dietary Deficiencies and Alcohol Abuse

On the average, 50 percent of the daily caloric intake of chronic alcohol abusers is in the form of ethanol. Alcoholic bever-

Photos courtesy of Mount Sinai School of
Medicine and Bronx VA Medical Center



Photos courtesy of Mount Sinai School of Medicine and Bronx VA Medical Center

Investigators at the NIAAA Alcohol Research Center at the Mount Sinai School of Medicine (CUNY) and Bronx VA Medical Center use sophisticated technology such as electron microscopy (left), high performance liquid chromatography (middle), and scanning electron microscopy (right) in their studies on alcohol and cancer.

ages, however, lack essential nutrients. Nutritional deficiencies, therefore, are common in this population. In a case-control study among black males in Washington, DC, for example, there was an 80-percent causal association between the incidence of esophageal cancer and alcohol consumption. In addition, poor nutritional status was an important risk factor for esophageal cancer within this group (Pottern et al. 1981; Ziegler et al. 1981).

The high prevalence of iron and zinc deficiency among alcoholics may be particularly relevant to esophageal cancers, for abnormal levels of iron in the bloodstream have been linked to the increased incidence of esophageal cancer (Kmet and Mahboubi 1972; Wynder et al. 1957). It should also be noted that experimental zinc deficiency enhances development of tumors (Gabriel et al. 1982).

Chronic ethanol consumption has striking effects on tissue vitamin A levels (see article beginning on page 18). Considering the enhancing effects of vitamin A deficiency on carcinogenesis, it is conceivable that part of the interaction of ethanol and cancer may be caused at least indirectly by the alteration of vitamin A status related to chronic alcohol abuse. Indeed, vitamin A deficiency has been shown to affect tumor induction at a number of sites in the body (Sporn 1977). The high incidence of esophageal cancer in Iran, for instance, has been related to specific nutritional deficiency of vitamin A (Cook-Mozaffari et al. 1979; Kmet et al. 1980).

Vitamin A plays a key role in the differentiation of epithelial cells, the cellular tissue that covers the body surfaces and lines most cavities in the body. Vitamin A also is known to control the development of malignancy in epithelial tissues (Cohen et al. 1976; Nettesheim and Williams, 1976; Newberne and Rogers 1973; Sporn and Roberts 1983). In part, enhanced carcinogenesis in vitamin A (retinol)-deficient epithelium may be related to increased DNA synthesis (Harris et al. 1973). At the tissue level, this is reflected in a marked hyperplasia (an abnormal multiplication or increase in the number of normal cells of the basal epithelium) (Harris et al. 1972). Conversely, vitamin A supplementation enhances differentiation of epithelial tissue, can prevent chemical induction of animal tumors (Moon et al. 1983) and, in some instances, inhibit growth of established tumors (Bollag 1983).

Deficiencies in some other vitamins have also been implicated in the pathogenesis of cancer. Riboflavin (vitamin B_2) deficiency is common among alcoholics—especially among those in the lower socioeconomic groups. Because riboflavin and iron play important roles in the activity of respiratory enzymes, deficiencies of both produce similar clinical features, including glossitis (inflammation of the tongue), cheilosis (dry scaling of the lips and corners of the mouth), and brittle nails. Wynder and Chan (1970) found significant hyperplasia on the skin of riboflavin-deficient mice; the importance of riboflavin also has been demonstrated by the fact that the skin of riboflavin-deficient mice shows increased susceptibility to tumor formation.

Pyridoxine (vitamin B_6) deficiency occurs in the alcoholic, and acetaldehyde—an intermediate in the metabolism of alcohol—has been incriminated in the accelerated destruction of the vitamin (Lumeng and Li 1974). In addition to its key function in the formation and development of blood cells (hematopoiesis), vitamin B_6 has been shown to play an important role in the production of antibodies in response to the administration of various antigens (Axelrod and Trakatellis 1964). This may influence tumor development indirectly. Wynder (1976) has related pyridoxine deficiency to enhanced liver tumor formation.

Abnormally low blood levels of vitamin E in alcoholics have been found by Losowsky and Leonard (1967) and Myerson (1968). Vitamin E has been found to reduce the development of tumors with certain carcinogens in a number of target organs (Harman 1961; Ulland et al. 1973; Wattenberg 1972).

Ethanol as a Cocarcinogen

While there is no evidence from animal feeding studies that ethanol per se is carcinogenic (McCoy et al. 1981; Schottenfeld 1979), it may act as a cocarcinogen by altering the metabolism and/or distribution of carcinogens, thus increasing the susceptibility of various tissues to chemical carcinogens (Swann 1984). Over the last 20 years, a number of animal studies have been conducted in which ethanol, either applied topically or administered as part of the diet, was shown to have a cocarcinogenic effect. Examples of these experiments include: the enhanced carcinogenesis of a certain carcinogenic compound (7,12-demethylbenzanthracene) applied either to the cheek epithelium of young hamsters (Elzay 1966, 1969) or to the skin of mice (Stenback 1969); the induction of benign tumors derived from the epidermis in mice by benzo(alpha)pyrene (Horie et al. 1965); and carcinomas and benign tumors derived from the epidermis by DMN (Gibel 1967).

Effects of Ethanol on DNA Metabolism

Replicating DNA, because of its partially single-stranded nature, is more reactive with many different chemical carcinogens than resting DNA (Singer and Fraenkel-Conrat 1969). Repeated cell injury and repair in the presence of carcinogens would be expected, therefore, to sensitize tissues to chemical carcinogens. There are two effects of ethanol on DNA metabolism that might be associated with cocarcinogenic activity, namely, its effects on sister chromatid exchanges (SCEs) and cellular repair of carcinogen-induced DNA damage. Sister chromatids are the two spiral filaments that make up a chromosome. Obe and Ristow (1979) have reported that acetaldehyde, the first metabolite of ethanol, induces an abnormal exchange of genetic information from one sister chromatid to another in cells grown in tissue culture. Daily treatment of Chinese hamster ovary cell cultures with acetaldehyde (above a concentration range of 0.25×10^{-3} to 1.5×10^{-3} percent v/v) produced a dose-dependent increase in SCEs (Obe and Beck 1979). By increasing the frequency of SCEs, such compounds could theoretically enhance the possibility of recessive mutations that would be converted from a heterozygous to a homozygous state and lead to tumor development. Along these same lines, Obe and Ristow (1979), from a comparison between their own data on chromosomal aberrations in peripheral blood lymphocytes from alcoholics and literature values, concluded that there is an elevation of chromosomal aberrations in alcoholics. The potential significance of these observations with respect to tumor promotion is related to the hypothesis that compounds with SCE activity may act as cancer promoters (Kinsella and Radman 1978). Additional evidence for chromosomal damage was provided by our observation of an increased frequency of micronuclei in bone marrow erythrocytes of rats fed alcohol, when compared to nutritionally pair-fed controls (Baraona et al. 1981).

Another set of observations pertaining to a possible cocarcinogenic effect also was made in our laboratory. As discussed in a companion paper by Garro and colleagues (see page 26), ethanol inhibits the repair of at least one type of carcinogen-induced DNA damage (Farinati et al. 1984).

Alcohol as a Solvent

Another hypothetical mechanism by which ethanol may act as a cocarcinogen is through its solvent effect. By solubilizing carcinogens, ethanol may allow higher concentrations of carcinogens to reach target cells within tissues (Kuratsune et al. 1965). Although this is a frequently mentioned mechanism, there is little in the way of experimental data to support it. Benzo(*a*)pyrene a known carcinogen, did penetrate mouse esophageal mucosa better when dissolved in alcohol than when dissolved in olive oil; however, an aqueous solution was about as effective as alcohol in penetrating the mouse mucosal surface (Kuratsune et al. 1965). Nevertheless, an increased number of esophageal cancers has been observed in mice given diethylnitrosamine (DEN) carcinogen-alcohol solutions as compared to those given a carcinogen in aqueous solution. Diminished peristalsis (the wave of muscular contraction by which the contents of the alimentary canal are propelled during digestion) and mucosal surface damage following alcohol exposure may increase the susceptibility of the esophagus to various carcinogens (Swann 1984). For instance, ethanol competes with the uptake of vinyl chloride by the tissue and thus interferes with the breakdown of vinyl chloride into its simpler compounds, presumably resulting in a prolonged exposure to this carcinogen in epithelial cells of the esophagus (Breeden 1984).

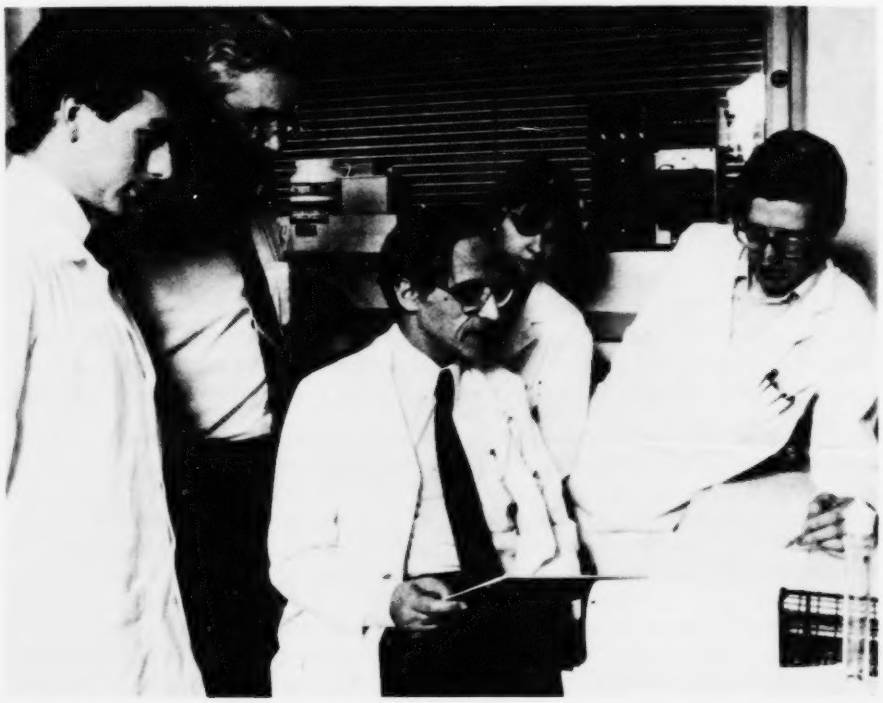


Photo courtesy of Mount Sinai School of Medicine and the Bronx VA Medical Center

Charles S. Lieber, M.D. (seated), and colleagues at the NIAAA Alcohol Research Center at the Mount Sinai School of Medicine (CUNY) and Bronx Veterans' Administration Medical Center.

Alcohol as a Cocarcinogen at Remote Sites: Microsomal Activation Systems

The association of alcohol consumption with cancers at sites that do not normally come into contact with high ethanol concentrations suggests that mechanisms other than, or in addition to, the toxic effects of ethanol directly upon cells play a role in carcinogenesis. One possible explanation for ethanol's ability to act as a cocarcinogen at remote sites as well as at ethanol-contact sites resides in ethanol's capacity to act as an inducer of the enzyme system involved in the metabolic activation of many structurally diverse chemical carcinogens (Gillette 1976; Miller and Miller 1977). This enzyme system is called the microsomal cytochrome P-450 dependent biotransformation system. Highly reactive intermediates have been found to be formed after metabolic activation by this system and these react with DNA, ribonucleic acid (RNA), and certain critical proteins.

A microsomal ethanol oxidizing system (MEOS) has also been described (Lieber and DeCarli 1968, 1970) and reconstitution of MEOS with the 3 microsomal components (cytochrome P-450, NADPH-cytochrome c reductase and lecithin) has been demonstrated by Ohnishi and Lieber (1977) and confirmed by Miwa and colleagues (1978) and Koop and colleagues (1982). Following chronic ethanol consumption, there is a significant increase in microsomal ethanol oxidization by the MEOS (Lieber and DeCarli 1968, 1970), which is associated with an increase in various constituents of proteins of the microsomal system, namely phospholipids, cytochrome P-450 reductase, cytochrome P-450, and certain drugs

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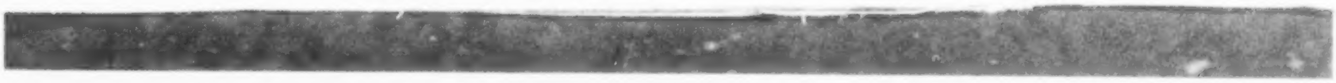

(Ishii et al. 1973; Joly et al. 1973). The increase of cytochrome P-450 is associated with the appearance of a distinct form of cytochrome P-450. The partially purified cytochrome P-450 induced by ethanol feeding is more active for alcohol oxidation than the control preparation (Koop et al. 1982; Ohnishi and Lieber 1977). Ethanol consumption also results in increased activities of a variety of microsomal enzymes detoxifying other drugs (Misra et al. 1971).

The stimulation of microsomal enzyme activities also applies to those enzymes that convert exogenous substrates to toxic compounds. For instance carbontetrachloride (CCl_4), a volatile substance that can depress central nervous system activity and cause degeneration of the kidneys and liver, exerts its toxicity only after conversion in the microsomes. Alcohol pretreatment dramatically stimulates the toxicity of CCl_4 (Hasumura et al. 1974; Maling et al. 1975).

It has been shown that there is a positive relationship between benzo(*a*)pyrene (BP) hydroxylase activity and tumor formation in vivo (Emery et al. 1978; Kellermann et al. 1973). It is of interest to note, therefore, that after administration of adequate liquid diets containing either 36 percent of total calories as ethanol or isocaloric carbohydrates to female Sprague Dawley rats for 15 days, hepatic BP hydroxylase activity was elevated by 57 percent in the ethanol-fed animals (Rubin et al. 1970). We extended these results on the effects of ethanol on BP metabolism in the liver (Seitz et al. 1979), including hepatic microsomal activation of BP to its mutagenic derivatives.

As mentioned before, in addition to polycyclic hydrocarbons (Matsuda et al. 1966), a number of nitrosamines have been detected in alcoholic beverages (Lijinsky and Epstein 1970). It is generally agreed that the initial step in the bioactivation of DMN to a methylating agent is microsomal N-demethylation. This reaction is catalyzed by several different isoenzymes of DMN demethylase. Ethanol has a unique effect in this regard: it induces microsomal DMN N-demethylase activity which functions at low DMN concentrations (Garro et al. 1981). This is in contrast to other microsomal enzyme inducers such as phenobarbital, 3-methylcholanthrene and polychlorinated biphenyls, which increase the activity of DMN N-demethylases whose activity is detectable only at relatively high DMN concentrations. Some of the unique effects of ethanol may be due to the induction of a specific form of cytochrome P-450 by ethanol (vide supra) (Koop et al. 1982; Ohnishi and Lieber 1977) with selective affinity for DMN (Yang et al. 1985).

There are conflicting reports regarding the effects of ethanol administration on DMN- and DEN-mediated tumorigenesis (Gibel 1967; Schmahl et al. 1965). In one study, pretreatment with ethanol had a protective effect against induction of liver tumors while in another it changed the organotropism (the special affinity of pathogenic agents for particular tissues or organs) of DMN resulting in an increased incidence of esophageal cancers and nasal cavity tumors (Teschke et al. 1983). The basis for these conflicting observations may be related to the opposing effects of ethanol on DMN metabolism. For instance, although ethanol exposure induces DMN-activating enzyme activity, ethanol may, when present under certain conditions, prolong the half-life of circulating DMN resulting in increased exposure of organs other than the liver (Tomera et al. 1984). This may be particularly important for organs with relatively less DNA-repair capacity than that of the liver.

The dose and route of DMN are also important in considering the inhibitory and inductive effects of ethanol on DMN metabolism. When DMN is administered orally, it passes thorough the liver via the portal circulation before entering the general circulation. The liver can thus effect a "first pass clearance" of DMN up to a dose of 30µ/kg (Swann 1984). At higher doses the hepatic enzymes are saturated and methylation in the kidneys and in other organs occurs. Ethanol, when given to rats in low amounts equivalent to a man drinking 0.5 liter of beer, prevents this "first pass clearance" by competing for hepatic microsomal enzymes. In ethanol-fed rats given DMN at 30µ/kg, methylation of kidney DNA is five times more than that of controls (Swann 1984).

Cytochrome P-450, NADH-cytochrome-P-450 reductase, and mixed function oxidase activities have been demonstrated also in the gastrointestinal tracts of several species (Chhabra et al. 1974; Stohs et al. 1976*a*, 1976*b*; Wattenberg 1972). Recent studies also have shown that this system may mediate the intestinal metabolism of drugs and carcinogens and can be induced by dietary constituents (Hoensch et al. 1975; Pantuck et al. 1975; Wattenberg 1971).

Because ethanol is a common dietary constituent and produced ultrastructural changes in intestinal mucosa similar to those in the liver (Rubin et al. 1972), it was reasonable to expect that the intestinal metabolism of xenobiotics (chemicals foreign to the biologic system) may also be altered by ethanol consumption. Indeed, elevated cytochrome P-450 levels and microsomal enzyme activities have been reported in the upper small intestine after chronic ethanol ingestion in rats (Joly and Hetu 1978; Seitz et al. 1978*a*, 1978*b*). Chronic ethanol ingestion increased intestinal BP hydroxylase activity by 200 percent and also enhanced the capacity of intestinal microsomes to activate BP to a mutagen in *S. typhimurium* (a microbial test system for mutagens). In the same test system, two other compounds, namely 2-aminofluorene and tryptophan pyrolysate, both of which need microsomal activation to become mutagenic, were used (Seitz et al. 1981). The capacity of intestinal microsomes to activate both compounds to mutagens was also significantly enhanced after chronic alcohol ingestion.

A Synergistic Role

Since alcohol and tobacco play a synergistic role with respect to carcinogenesis in the oropharynx, larynx, and esophagus (Wynder et al. 1977), we wondered also whether chronic ethanol administration to rats might increase pulmonary activation of procarcinogens contained in tobacco pyrolysates (organic substrates that are altered by rise in temperature) and smoke condensates, which, when activated by microsomes, have been known to be mutagenic (Sato et al. 1977).

Tobacco pyrolysates were prepared from commercially available cigarette tobacco that was heated under vacuum at 500 degrees for 1 minute (Matsumoto et al. 1977) and tested for mutagenicity following activation by lung microsomes in the Salmonella mutagenesis assay. An enhanced activation to mutagenic derivatives was observed with lung microsomes from ethanol-fed rats (Farinati et al. 1984; Seitz et al. 1981).

Microsomal activation of nitrosopyrolidine, a procarcinogenic constituent of cigarette smoke, is enhanced by alcohol consumption in both hamsters (McCoy and Wynder 1979) and rats (Farinati et al. 1984). Ethanol was shown to act as a cocarcinogen for this procarcinogen (McCoy et al. 1981).

Thus, it has been found that chronic ethanol consumption enhances the capacity for microsomal activation of a variety of procarcinogens. This effect of ethanol can be detected in a number of different tissues such as liver, lung, and intestine, and may also occur in the tissues in which there is an alcohol-associated risk of cancer. It still remains to be proved, however, whether this enzyme-inducing effect of ethanol is a contributory factor in alcohol-associated cancers. Although the microsomal cytochrome P-450 biotransformation system clearly is essential for the activation of most chemical procarcinogens, induction of this enzyme system does not necessarily entail an increased cancer risk (Capel et al. 1978; Huggins et al. 1964; McLean et al. 1971; Peraino et al. 1971; Wattenberg et al. 1970). This is probably related to the fact that the components of the microsomal biotransformation system and associated enzymes such as epoxide hydratase, glutathione transferase and UDPGA transferase also are involved in the detoxification of many of the same chemicals that require activation. Ultimately, what is probably most critical in the relationship between enzyme activity and carcinogenesis is the relative effect of inducers, such as ethanol, on the steady-state levels of activated carcinogens. This may be particularly important in the esophagus where ethanol has a much greater effect on carcinogen-activating systems relative to detoxifying enzymes than in the liver (Farinati et al. 1984).

Hepatitis B Virus and Immunosuppression

Hepatocellular carcinoma (cancer affecting the liver cells), although infrequent in Western countries, it is a common neoplasm in the Orient. One possible reason is the high incidence of hepatitis B virus (HBV) in the Orient and the strong association between the latter and hepatocellular carcinoma (Beasley et al. 1981, 1982; Szmuness et al. 1978). It has been suggested that viral hepatitis is also more commonly represented in alcoholics than in corresponding nonalcoholic populations and thereby could contribute to the increased incidence of hepatocellular carcinoma. Indeed, an increased prevalence of serologic markers of viral hepatitis was reported in alcoholics (Mills et al. 1979, 1981). These authors felt such a response was specific for HBV. Their results have been confirmed in alcoholics from a different geographic area (Hislop et al. 1981). Brechot and colleagues (1982) reported that among 51 subjects in various stages of alcoholic liver disease, 19 had one or more serologic markers of HBV in their serum. In addition to evaluating serologic markers of HBV, these authors also investigated the presence of viral DNA in the liver. Eight of the 51 subjects with alcoholic liver disease demonstrated HBV DNA in their livers. In 5 of these subjects, the DNA was integrated into the genome (which comprises the complete set of hereditary factors). Whether this increased incidence of serologic positivity merely reflects the relatively low socioeconomic status of the alcoholics in the group, whether it is a consequence of increased exposure to hepatitis infection from blood transfusions, or whether it results from enhanced susceptibility to infection remains to be determined. In any event, evidence is accumulating that suggests a relationship between viral hepatitis and hepatocellular carcinoma in the alcoholic.

Brechot and colleagues (1982) evaluated 20 subjects with alcoholic cirrhosis and hepatocellular carcinoma. Of these, 16 were tested serologically, that is, evaluations were made by means of antigen-antibody reactions taking place in the blood. Only 9 out of these 16 had serologic markers of HBV infection. However, in all 20 subjects with cirrhosis and hepatocellular carcinoma, the presence of HBV DNA integrated into the genome of the neoplastic liver cells was demonstrated. Thus, those authors concluded that HBV plays a part in the pathogenesis of primary liver cell carcinoma in the alcoholic. Similar results have been obtained in five of eight alcoholics with underlying hepatocellular carcinoma who showed a lack of antibody to HBV (Wands et al. 1985). Similarly, other authors who assessed the prospective serologic status of a group of 125 "asymptomatic" alcoholics, 163 alcoholics with cirrhosis, and 46 subjects with hepatocellular carcinoma (Goudeau et al. 1981) have noted the presence of HBV markers in 31 percent of these asymptomatic alcoholics, 55 percent of the alcoholics with cirrhosis, and 22 percent of those with hepatocellular carcinoma. Another study in a small number of well-matched alcoholics (Yarrish et al. 1980) reported similar rates of HBV infection in both alcoholic and nonalcoholic subjects with hepatocellular carcinoma. However, these authors divided subjects into groups based on alcohol history and not on the basis of histopathology as has been done by other authors. In addition, these authors studied primarily those subjects from areas nonendemic for HBV virus. Of their alcoholic subjects with hepatocellular carcinoma, 87.5 percent had HBV markers in their serum compared to 69 percent of nonalcoholic subjects with hepatocellular carcinoma. Further support for the interaction between alcohol and HBV infection has been provided by Ohnishi and colleagues (1982) who noted that hepatocarcinogenesis was hastened significantly in seropositive HBV-carriers if they continued drinking. The average age of the seropositive patients was 19 years younger than the nondrinkers. These results contrast with an autopsy study (Omata et al. 1979) in which there was no difference in the frequency of hepatitis infection in alcoholic cirrhotics with or without hepatocellular carcinoma. However, in this group, the diagnosis of alcoholism was based solely on the pathology of tissue samples. The varied ethnicity of the groups also makes interpretation of seropositivity difficult.

In addition to the association between HBV infection and hepatocellular carcinoma, an association between cirrhosis and hepatocellular carcinoma has been observed (Johnson et al. 1978; Theodoropoulos et al. 1975). Indeed, the incidence of cirrhosis in patients with hepatocellular carcinoma has been reported to vary between 16 and 80 percent (Chan 1975), with most reports indicating a 55 to 80 percent association. In western countries, the primary etiologic agent of cirrhosis is alcohol (Lelbach 1975; Martini and Bode 1970). Cirrhosis was produced experimentally by feeding alcohol to baboons (Lieber and DeCarli 1974). Clinically, hepatocellular carcinoma in alcoholics commonly occurs in association with cirrhosis of the liver. However, cirrhosis may contribute to the development of cancer independently of alcohol. Indeed, numerous etiologies have been proposed for carcinoma in cirrhotic patients, mostly in conjunction with the regeneration process associated with cirrhosis.

Thus, the presence of cirrhosis complicates attempts to define pathophysiologic mechanisms or etiologic agents in subjects with hepatocellular carcinoma.

Other Possible Mechanisms

In addition to the interaction between cirrhosis and hepatitis in the pathogenesis of hepatocellular carcinoma, other mechanisms may play a role. It has long been conjectured that tumors are recognized and eliminated by the immune system, particularly by T-cell-mediated responses. T-cells are white blood cells that can kill tumor cells. Because several studies have shown an association between heavy drinking and decreased immune responsiveness (Berenyi et al. 1974; Bernstein et al. 1974), alcohol-associated immuno-

Analysis by high performance liquid chromatography can be used to show how alcohol activates the toxicity of industrial solvents, drugs, and carcinogens and interacts with vitamin A.

Photo courtesy of Mount Sinai School of Medicine and the Bronx VA Medical Center

suppression has been considered a possibly contributing factor for increased risk of cancer (Daynes et al. 1979). For the most part, however, the studies that associated alcohol abuse with decreased immune response were conducted with patients who already had alcoholic liver disease and it is therefore unclear whether the decreased immune effects were due directly to ethanol or whether they reflected other aspects of the ongoing disease process. Furthermore, there is reason to question the significance of immunosuppression in general oncogenesis. Immunodeficient patients or animals that are immunosuppressed have an increased incidence of cancer, but the cancers observed are mostly lymphoreticular neoplasms (new growths in the lymph nodes) (Baird et al. 1982; Daynes et al. 1979). Nude mice, which have a defect in their T-cell-mediated immune response, have been used as a model for studying the relationship between tumorigenesis and immunosuppression. These animals, at later stages of their life cycles, have a higher incidence of lymphoreticular tumors, but relative to normal mice, they do not have an increased incidence of spontaneous tumors in other organs nor are they more prone to develop tumors when treated with chemical carcinogenesis (Rygaard and Povlson 1974; Stutman 1979). It seems that T-cell-mediated immunity plays a minor part in the control of spontaneous or chemically induced tumors of organs other than the lymphoid system. It seems therefore unlikely that immunosuppression is an important factor for increased risk of chemically induced cancers associated with alcohol as a cocarcinogen. However, an elevation of suppressor T-cells has been reported to be useful both in early detection of hepatocellular carcinomas and in prognosis (Yao et al. 1984).

On the other hand, it is generally accepted that the immune system plays a vital part in the defense against virally induced tumors. Ever since the pioneering work of Gross (1983), the etiologic role of viruses in the pathogenesis of certain tumors has been established. Observations in animals where T- and B-cell numbers and functions are impaired after chronic ethanol feeding suggest that such decreased leucocyte mobilization may be important in virally induced tumors such as hepatocellular carcinomas that have been associated with hepatitis B infections (Rimland 1984; Robinson et al. 1983; Roselle and Mendenhall 1984).

Another author (Purtilo 1979) has speculated that immunoincompetence based either on mutant x-linked recessive immunoregulatory genes, or differences in hormone milieu or acquired immunodeficiency may be related to the increased incidence of hepatocellular carcinoma.

Thus, there is an accumulation of evidence for an association between hepatitis B virus (HBV) and increased incidence of hepatocellular carcinoma. Alcoholics, at least in some groups, have a high incidence of HBV exposure and, therefore, it is not unreasonable to speculate that this may contribute to the increased frequency of hepatocellular carcinoma in the alcoholic population. Other factors, of course, are also involved, including the increased incidence of cirrhosis in the alcoholic and the various clinical and nutritional factors mentioned before in this review.

Conclusions

Alcohol may contribute to carcinogenesis through a variety of mechanisms, including:

- Contact-related local effects;
- The carcinogenic effects of congeners;
- The impact of nutritional deficiencies;
- The effect of ethanol on DNA metabolism;
- The effect of ethanol on induction of microsomal enzymes that activate procarcinogens;
- Association with the HBV virus as well as general mechanisms of tissue injury and regeneration; and
- Immunosuppression.

The relative role of each of these factors has not been well defined in individual cases of alcohol-associated cancer, but the possible effects of these various mechanisms, associated with the unquestionable statistical association between ethanol abuse and this increase in cancer, indicate a causal relationship between the two.

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Interaction of Ethanol with Vitamin A in Liver and in Tumor Development

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Increasing evidence for a role of vitamin A in the proliferation and differentiation of a variety of human cells makes it apparent that disturbances in vitamin A levels may play a significant role in the development of tumors. In fact, vitamin A deficiency has been associated with the formation of various types of tumors (Sporn 1977).

For instance, epidemiological studies in the United Kingdom (Atukorala et al. 1979; Basu et al. 1976; Wald et al. 1980) and the United States (Kark et al. 1981) have revealed an increased risk of bronchogenic carcinoma (cancer originating in a bronchus) in association with low serum vitamin A levels. Other studies, however, have failed to show such a positive correlation.

In experimental animals, deficiency of vitamin A is known to lead to the development of squamous metaplasia—the transformation of normal ciliated cells into stratified squamous (scaley or platelike) cells—in the epithelium of the trachea, bronchi, and other organs. The epithelium is the cell layer that covers internal and external surfaces of the body, including the lining of vessels and other small cavities (Harris et al. 1972; Salley and Bryson 1957; Wolbach and Howe 1925; Wong and Buck 1971). Such changes in the respiratory epithelium are frequently found to precede, or to be associated with, tumor development (Auerbach et al. 1961; Becci et al. 1978; Harris et al. 1973; Saffiotti et al. 1972; Schreiber et al. 1974; Stenback and Sellakumar 1974; Trump et al. 1978; Umiker and Storey, 1952; Weller 1953; Williams 1952; Valentine 1957).

Indeed, several studies of the natural histories of bronchogenic carcinomas in humans suggest that squamous metaplasia is one of the earliest stages preceding the development of carcinomas at the site of origin (Auerbach et al. 1961; Trump et al. 1978; Umiker and Storey 1952; Weller 1953; Williams 1952).

We found that concomitant ethanol consumption and vitamin A deficiency resulted in an increased severity of squamous metaplasia of the trachea (see Figures 1 through 3) (Mak et al. 1984). It is conceivable that this potentiation of vitamin A deficiency by alcohol use may predispose the tracheal epithelium to form a neoplasm, a new and abnormal growth, in the presence of a carcinogenic insult. Indeed, it has been shown in animal studies that vitamin A deficiency increases the susceptibility to neoplasia and enhances carcinogenesis in the respiratory tract following the administration of carcinogenic polycyclic hydrocarbons (Cone and Nettesheim 1973; Nettesheim and Williams 1976).

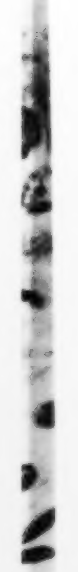
Conversely, treatment of animals with vitamin A or its derivatives in high doses protects against the induction of tumors of the respiratory tract (Nettesheim et al. 1976; Saffiotti et al. 1967). These animal studies are consistent with a growing body of epidemiological data that human lung cancer risks are inversely correlated with low levels of retinol (vitamin A) and dietary vitamin A intake.

At present, the underlying mechanism by which ethanol may promote squamous metaplasia of the trachea resulting from vitamin A deficiency is not fully known. It was found that ethanol consumption depletes vitamin A levels in the liver (Leo and Lieber 1982; Sato and Lieber 1981). One may postulate that ethanol ingestion may also interact with vitamin A deficiency in the target tissue, namely, the tracheal epithelium, leading to abnormal cellular proliferation and differentiation. Indeed, a relatively high risk of squamous cell carcinoma of the lung was found in a Norwegian population that drank large amounts of alcohol and had a low dietary intake of vitamin A (Kvale et al. 1983). Furthermore, a positive association between alcohol consumption and lung cancer has been reported in Japanese men in Hawaii (Pollack et al. 1984).

Epithelial cells of the trachea normally are ciliated. That is, the cells have tiny, hairlike processes that beat rhythmically to move fluid or mucous films over their surface. The tracheal cells of rats administered alcohol and fed a low vitamin A diet showed a striking loss of cilia. And in rats fed a vitamin A-free diet plus ethanol, ciliated cells were found to have an increased number of lysosomes, minute organelles containing sacs of digestive enzymes (Mak et al. 1984). This finding is noteworthy, because increased numbers of lysosomes have also been reported in the ciliated cells of the hamster tracheas exposed to carcinogens (Harris et al. 1971), and in livers of vitamin A-deficient rats or patients (see Figure 4).

Another abnormality exhibited by the ciliated cells after ethanol consumption in the vitamin A-deficient rat was the appearance of compound cilia. Similar abnormal cilia have been observed in animals exposed to carcinogens or cigarette smoke as well as in humans with bronchial cancer (Harris et al. 1974; Reznik-Schuller 1975).

The genesis and functional capacity of the compound cilia are not known. They



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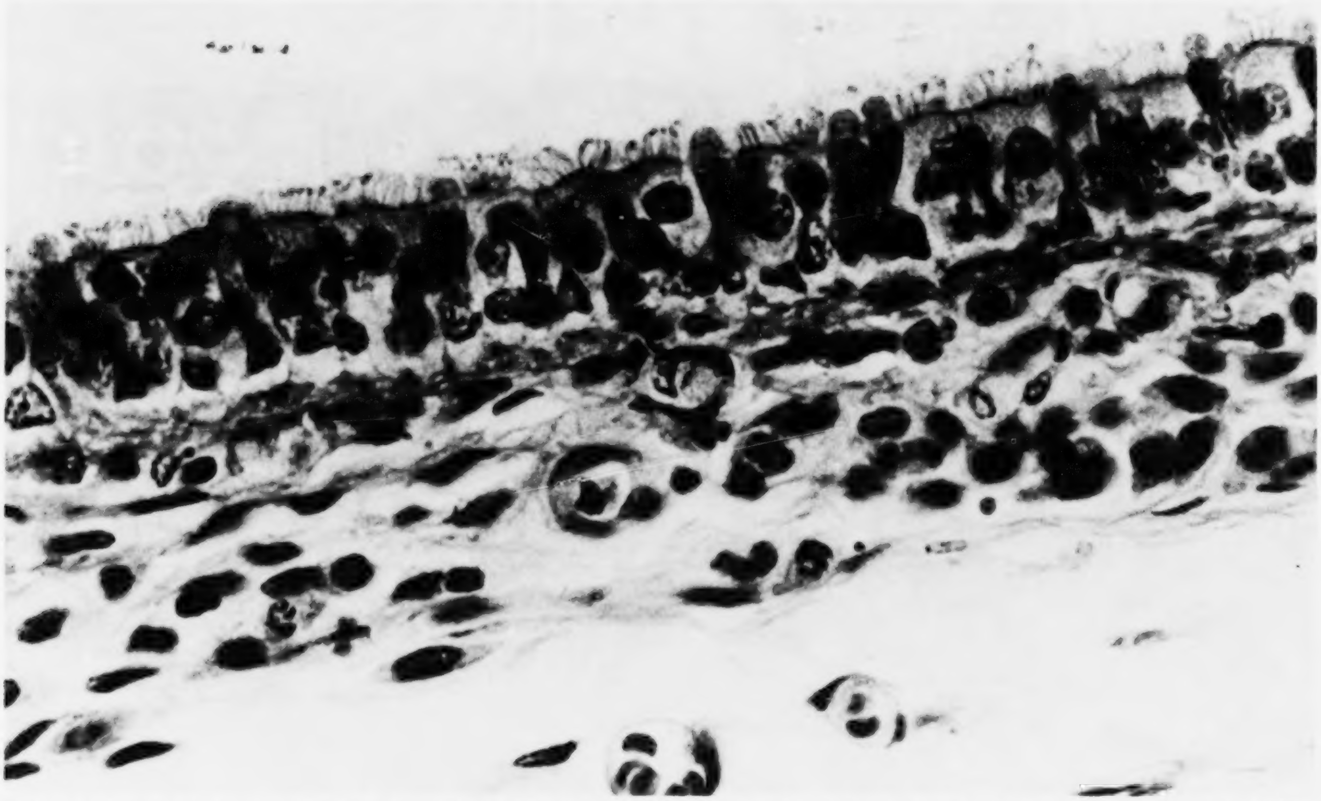

Figure 1 shows tracheal epithelium (magnified 300 times) from a rat fed a normal vitamin A diet (from Mak et al. 1984).

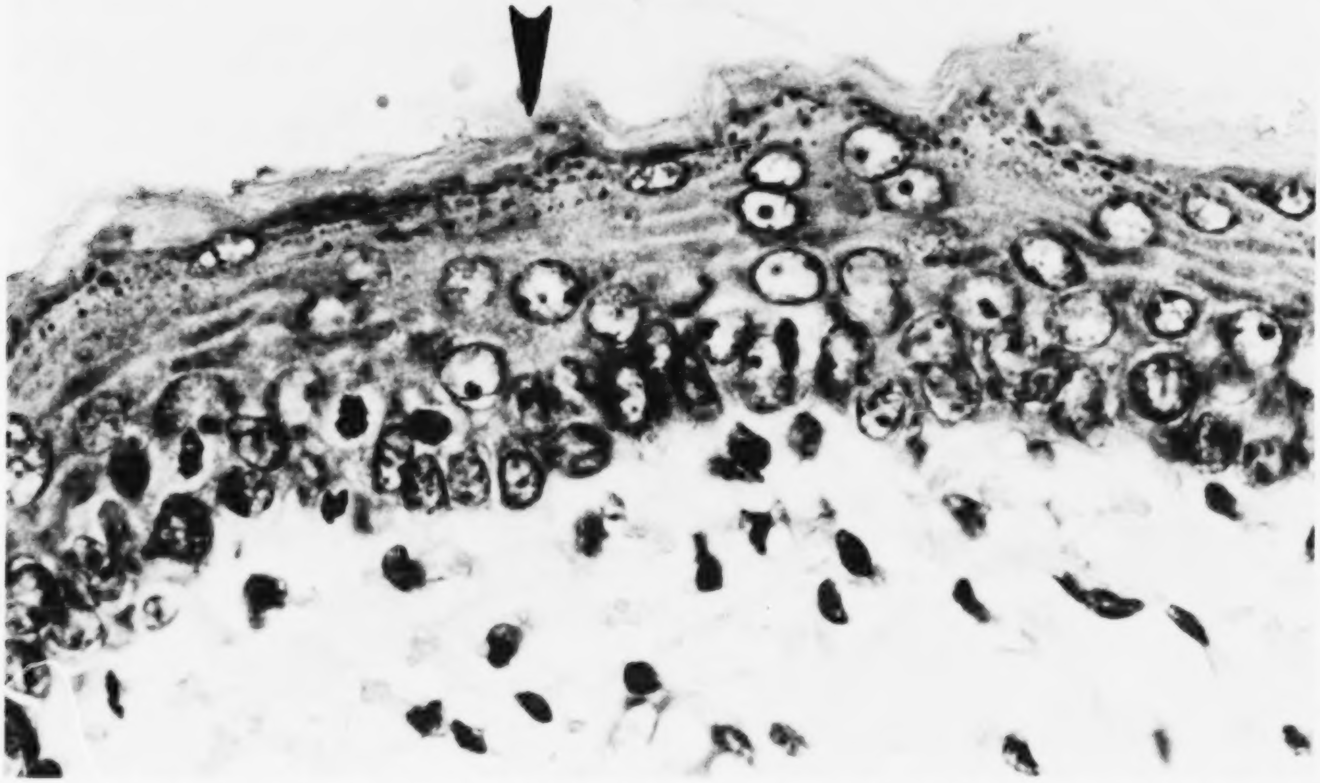

Figure 2 shows the transformation of the pseudostratified ciliated epithelium (shown in Figure 1) into stratified squamous epithelium. This process called squamous metaplasia may predispose the tissue to form a neoplasm in the presence of a carcinogenic insult (from Mak et al. 1984).

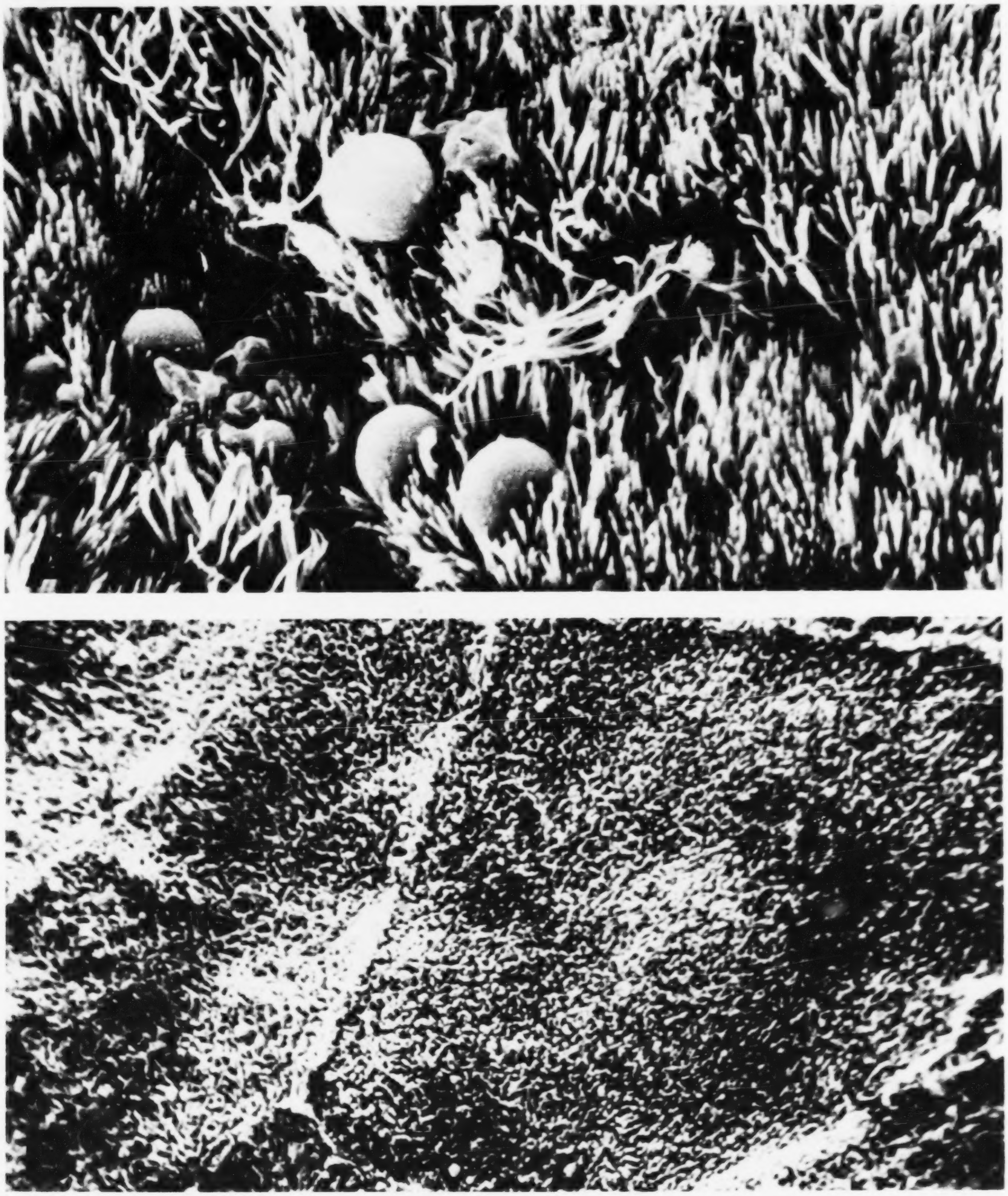

Figure 3. Scanning electron micrographs show the luminal surface of the tracheal epithelium magnified 3,800 times. Figure 3A shows the normal appearance of cilia in the epithelial surface from a rat fed a normal vitamin A diet. Figure B shows the abnormal appearance of the surface of a metaplastic lesion of a rat fed a vitamin A-free diet plus ethanol. Note that the epithelial surface is marked by minute ridges and microvilli (protrusions) instead of cilia (from Mak et al. 1984).

may represent a nonspecific response of the epithelium but their presence may be associated with an increased susceptibility of the tracheal epithelium to noxious agents.

In any event, the synergistic effects of vitamin A deficiency and ethanol could contribute to the increased incidence of respiratory cancer seen in the alcoholic.

Hepatic Disorders Associated with Vitamin A Deficiency

The nutritional need for vitamin A is still not fully known. The present recommended daily dietary allowance is 1,000 mcg (or 3,000 International Units) of vitamin A as retinol equivalents in male adults and 800 mcg in females (National Academy of Sciences 1980); however, the average diet usually contains at least twice that level in Western countries. Still, in many areas of the world where poverty and poor nutrition are prevalent, vitamin A deficiency remains a major problem, particularly among preschool children.

The most important clinical effects of vitamin A deficiency are in the eyes and are grouped under the term "xerophthalmia," a condition first characterized by dryness of the conjunctiva (the mucous membrane that lines the eyelids and covers the "whites" of the eyes) and cornea (the transparent anterior structure of the eye's outer coat that covers the iris and pupil). Although dietary vitamin A deficiency does not appear to be a serious public health problem in Western countries, post mortem studies have found apparently reduced liver reserves of vitamin A in a significant number of people in the West (Raica et al. 1972; Underwood et al. 1970). These values do not necessarily reflect borderline intake. They could be a consequence of metabolic abnormalities, possibly secondary to a high prevalence of alcohol and drug abuse in the populations examined.

Indeed, one of the most interesting developments in the vitamin A field was the recent recognition that both heavy alcohol consumption and drug use may lead to severe depression in vitamin A levels in the liver. This depletion has been hitherto unrecognized, in part because it is not associated—at least in the early stages—with decreased blood levels of vitamin A. It was commonly known that alcoholics with cirrhosis may suffer from night blindness (Patek and Haig 1939), which is possibly related to vitamin A deficiency (Wald 1968). However, more recent studies have shown that plasma vitamin A and levels of retinol-binding protein (RBP—the protein that transports retinol into the plasma) are decreased in patients with alcoholic cirrhosis (McClain et al. 1979; Smith et al. 1975). In the past, these complications have usually been attributed to malnutrition, since poor dietary intake has been reported in alcoholics with or without cirrhosis (McClain et al. 1979; Patek et al. 1975). It is also possible that these complications may result from hepatic injury because decreased plasma vitamin A and RBP levels have been reported in patients who do suffer liver disease but who do not drink and who do not exhibit alcohol-associated malnutrition (Smith and Goodman 1971). Low plasma levels in such patients have been postulated to be due to defective synthesis of RBP in the liver (Smith and Goodman 1971).

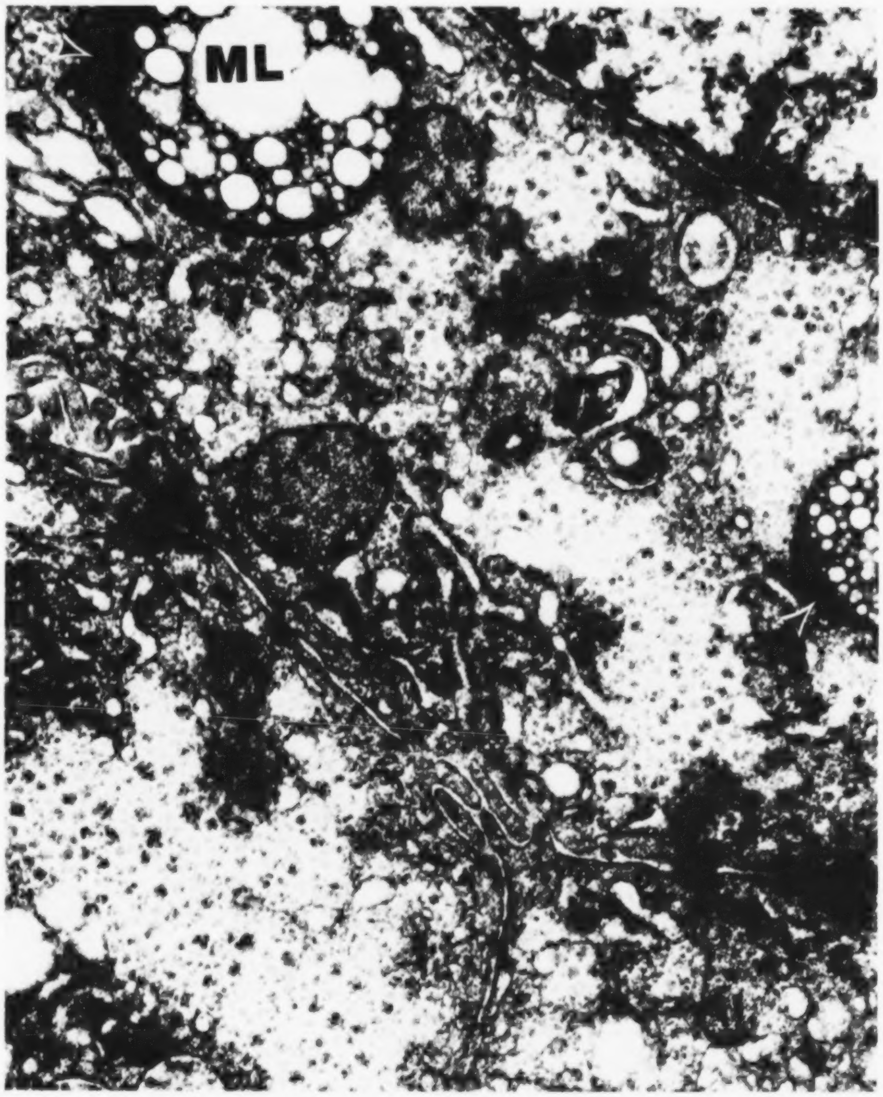

Figure 4. Hepatocyte (liver cell) of an alcoholic with hepatic vitamin A depletion. Note the presence of two multivesicular lysosomes (the larger of the two is marked ML) and their characteristic crescent shape (from Leo et al. 1983).

Alcoholic cirrhosis is often associated with zinc deficiency, a condition which impairs mobilization of RBP from the liver and thus could play a role in decreased plasma RBP (McClain et al. 1979; Smith et al. 1973; Smith et al. 1975). These classic aspects of vitamin A deficiency caused by either poor dietary intake or severe liver disease have been the subject of previous reviews (Goodman 1984; Russell 1980) and will not be discussed here. Instead, we shall focus on information that has recently become available concerning direct effects of alcohol on vitamin A metabolism and resulting alterations of hepatic vitamin A levels even at early stages of alcoholic liver injury (Leo and Lieber 1983*a*; Lieber and Leo 1985).

In addition to the mobilization of retinol (vitamin A) from the liver bound to RBP, some of the retinol can be further metabolized to retinal and retinoic acids via cytosolic (the cellular milieu called cytoplasm) enzymes such as the retinol dehydrogenase (Sporn et al. 1984).

More recently, a new pathway of retinol metabolism which has a much greater potential for retinol breakdown than the retinoic acid degradative pathway was discovered in liver microsomes (Leo and Lieber 1985). Microsomes are membranes found in the cytoplasm of cells and are associated with protein synthesis and drug metabolism. Stimulation of these degradative mechanisms, as well as enhanced mobilization from the liver (M. Sato and Lieber 1982), could result in significant depletion in hepatic vitamin A.

Indeed, drugs that "induce" liver microsomes have been shown to result in a decrease of hepatic vitamin A (Leo et al. 1984). A similar effect was also observed after ethanol (M. Sato and Lieber 1981) and other xenobiotics (chemicals foreign to the biologic system) that are known to interact with liver microsomes, including carcinogens, were administered to animal subjects (Innami et al. 1976; Kato et al. 1978; Reddy and Weisburger 1980). These observations were then expanded to humans (Leo and Lieber 1982). Patients with alcoholic liver disease were found to have very low levels of hepatic vitamin A at all stages of their disease (see Figure 5). In subjects with alcoholic fatty liver, hepatic vitamin A concentration was, on the average, one-fifth lower than in normal livers. In patients with alcoholic hepatitis, liver levels of vitamin A were depressed even further to one-tenth of normal values or less. The lowest hepatic vitamin A levels were observed in patients with cirrhosis whose values were 30 times below normal.

Thus, alcoholic liver disease is associated with severely decreased hepatic vitamin A levels, even when liver injury is moderate, as in the condition known as fatty liver, and when blood levels of vitamin A, RBP, and transthyretin (a blood protein) are still unaffected. RBP, which has been considered as a good and sensitive index of vitamin A deficiency, was also normal in the subjects with alcoholic fatty liver (Vahlquist et al. 1978).

Other results indicate that drug use may also be associated with hepatic vitamin A depletion (Leo et al. 1984). Indeed, 11 patients with moderate drug induced liver changes were found to have extremely low hepatic vitamin A levels—levels that were less than 10 percent of normal—though their serum vitamin A, RBP, and transthyretin were within the normal range.

Taken together, these observations show that even when hepatic vitamin A storage is depressed, the plasma vitamin A level is not necessarily decreased. Therefore, plasma vitamin A determination may not be a good marker for abnormalities in hepatic vitamin A storage in alcoholic patients. Since a vast segment of our population is subjected to widespread use of either alcohol or drugs, there are reasons to believe that hepatic vitamin A depletion may not be uncommon and, therefore, some concern regarding possible adverse effects on the liver is warranted. Indeed, some types of liver damage may be indicated by the appearance of multivesicular lysosomes which were observed in apparent relationship to lowered hepatic vitamin A levels (Leo et al. 1983). Ethanol appears to potentiate the effect of vitamin A deficiency, as indicated by the greater frequency of multivesicular lysosomes in animals given ethanol with the vitamin A-deficient diet compared to the rats fed the vitamin A-deficient diet alone (Leo et al. 1983).

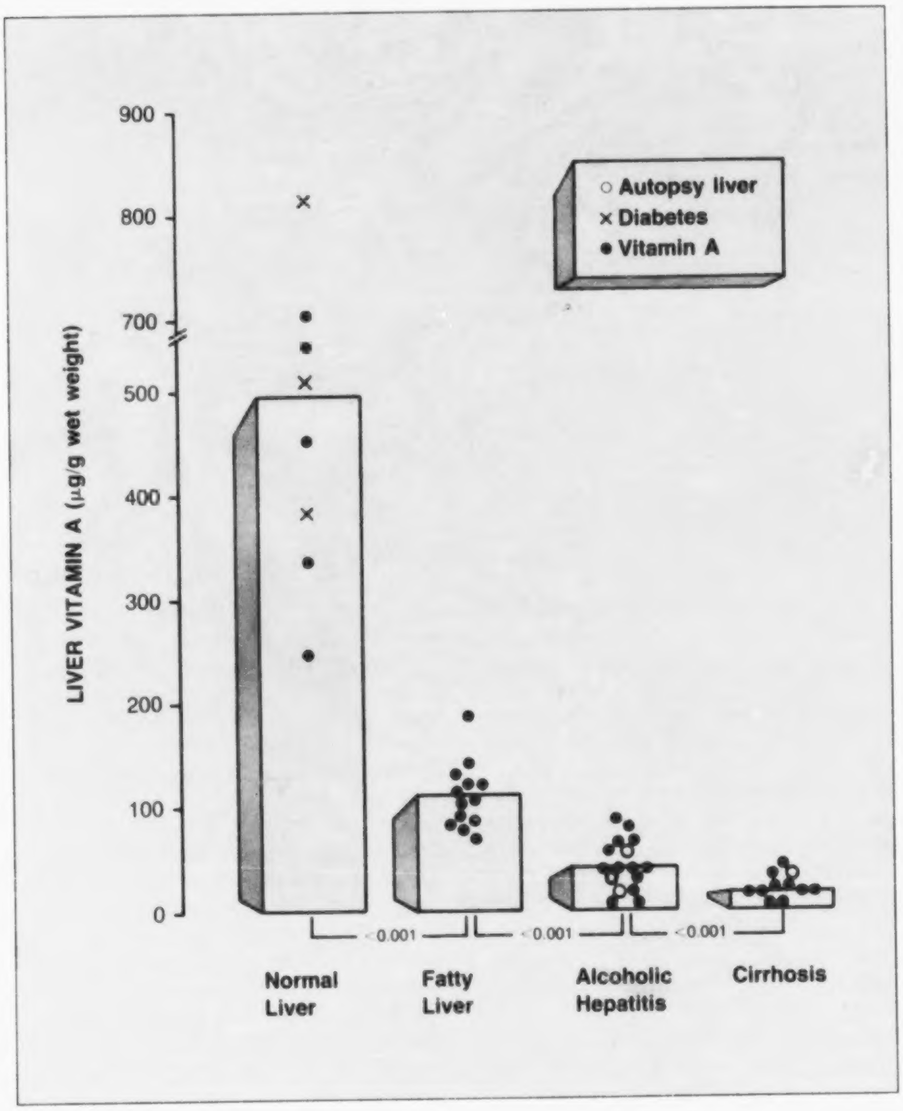

Figure 5. Hepatic vitamin A levels in subjects with normal livers and in subjects with various stages of alcoholic injury (from Leo and Lieber 1982).

Therapeutic Implications, Including Toxicity, of Vitamin A

In view of the possible adverse effects of low vitamin A in terms of carcinogenesis and alcohol- and drug-induced liver disease, the question of the therapeutic use of vitamin A must be raised (Vahlquist et al. 1978). Such treatment might be particularly indicated when serum levels of the vitamin are low (Mobarhan et al. 1981; Russell et al. 1978), but it is noteworthy that even in the presence of normal serum vitamin A, levels of vitamin A in the liver may be severely depressed.

Just how much vitamin A should be given to these patients is still an open question. Indeed, although vitamin A deficiency might adversely affect the liver, an excess of vitamin A is also known to be hepatotoxic (toxic to the liver).

Among other therapeutic uses, vitamin A has been included in the treatment of alcoholics with hypogonadism (a condition characterized by diminished size of the gonads) (McClain et al. 1979) and abnormal adaptation of vision to darkness (McClain et al. 1979; Russell et al. 1978). The amounts administered, which ranged from 3,000 mcg per day for up to 5 months to 15,000 mcg per day for 1 week, are usually considered safe because no adverse effects have been reported in normal individuals with these dosages. It must be pointed out, however, that in the case of other hepatotoxic agents, alcoholics were reported to have an unusual susceptibility to the drug in terms of toxicity to the liver (Lieber 1980). In rats, alcohol pretreatment has been shown to promote the hepatotoxicity of drugs and other hepatotoxic agents such as acetaminophen (C. Sato et al. 1981) and carbon tetrachloride (Hasumura et al. 1974). Recent experimental studies by Leo and colleagues (1982) and Leo and Lieber (1983*b*) showed that ethanol also promotes the hepatotoxicity of vitamin A.

In the first study (Leo et al. 1982), rats were fed diets for 2 months with either normal content or with vitamin A content increased fivefold, both with or without ethanol. The blood levels of vitamin A were unaffected whereas liver levels of vitamin A were increased by vitamin A supplementation and decreased by ethanol. As a net result, the liver vitamin A content of the high-A-ethanol group was not necessarily greater than that of the normal-A-control group, suggesting that metabolites of vitamin A rather than vitamin A itself may have been responsible for the promotion of vitamin A toxicity by ethanol.

The potential toxicity of consuming high levels of vitamin A has been well documented for many years. One of the most striking examples of what is now called acute hypervitaminosis A afflicted Arctic explorers who, after devouring polar bear liver, suffered lethargy, headache, vomiting, and, a day later, severe scaling of the skin (Rodahl and Moore 1943). Their affliction is now known to have been caused by the enormous quantities of vitamin A stored in polar bear liver. Chronic hypervitaminosis A may exist for many years without recognition (Stimson 1961), eventually resulting in hepatocellular damage and hepatic fibrosis (fibrous degeneration of tissues of the liver). Hypervitaminosis A and alcoholism can, of course, occur together. It is conceivable that signs of toxicity which are classically attributed to large vitamin A overdosage may, in fact, also be observed in a vast segment of our population taking more moderate vitamin A supplementation but abusing ethanol. Indeed, if the results we obtained in the rat can be extrapolated to man, it is apparent that amounts of vitamin A which can be considered relatively safe under normal conditions do acquire unusual toxicity when associated with chronic ethanol consumption. Furthermore, a relatively high intake of vitamin A can be readily achieved because capsules containing 25,000 IU are available over the counter.

Recommendations

In the therapeutic uses of vitamin A, the clinician must carefully weigh potential beneficial effects against enhanced toxicity. In view of the hepatic vitamin A depletion associated with the use of ethanol and other drugs, one must raise the issue whether the recommended daily allowance of vitamin A should be increased in the large segment of our population subjected to chronic drug and/or alcohol use. One still has to determine, however, how much vitamin A can be used to correct or prevent lesions of hypovitaminosis A without at the same time causing vitamin A toxicity. Careful monitoring of patients treated with vitamin A is therefore mandatory but there are at present no readily available measurements to detect early signs of toxicity. It is noteworthy that vitamin A levels in the serum may be quite normal in the presence of high liver vitamin A and associated hepatotoxicity, especially where there is concomitant liver disease.

Measurements of vitamin A in liver biopsies may not be revealing, since the actual level found may again result from two opposite changes, namely, the decrease of vitamin A associated with chronic ethanol and/or drug use (Leo and Lieber 1982; Leo et al. 1984) and the increase in vitamin A associated with vitamin A therapy. The theoretical possibility exists that some toxicity may be due not to vitamin A itself, but to some of its metabolites, the production of which might be increased by chronic ethanol and/or drug use. In the absence of signs for the early detection of the toxicity of vitamin A, great caution should be exercised in selection of the dosage of vitamin A used for the therapy, especially when dealing with complications associated with alcoholism, since in the alcoholic, the beneficial range of vitamin A supplementation may fall within a narrow therapeutic window. Optimal amounts have not been codified and may vary from individual to individual; at present, it appears prudent not to exceed a retinol supplement of 5000 IU per day under most circumstances and 3000 IU per day in the presence of a normal diet. □

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Ethanol and the Repair of Deoxyribonucleic Acid (DNA)

Anthony J. Garro, Ph.D.
Noel Espina, B.S.
Fabio Farinati, M.D.
Charles S. Lieber, M.D.

***Editor's note**: The following article describes research on alcohol's effect on DNA repair mechanisms. The article has been edited for our readers. Those who wish to receive more technical information regarding Dr. Garro's research may contact Dr. Garro at The City University of New York Medical School, New York, N.Y. 10031.*

One of the mechanisms by which alcohol abuse may increase one's risk of developing cancer is the inhibition of the capacity of cells to repair carcinogen-induced damage to DNA, the molecule within the cell that contains genetic information.

This damage can be inflicted upon DNA by a variety of carcinogens which react either directly with DNA, or which, during the course of their metabolism, are converted into DNA-reactive substances. These carcinogens react with and damage the purine and pyrimidine bases whose sequence within the double helix of DNA molecules forms the genetic blueprint that directs all cellular functions (See Figure 1). In disrupting this sequence, chemical carcinogens can alter normal cellular growth patterns ultimately resulting in the sort of uncontrolled cellular growth characteristic of cancer.

As if to protect against this, it is now known that cells possess various enzymes, among them 0^6 MeG transferase, that can actually repair damaged portions of the DNA molecule (Pegg et al. 1982). In fact, DNA is the only cellular constituent for which repair enzymes are known to exist.

These DNA repair systems are composed of various enzymes, some of which are capable of the following:

- Repairing breaks in the biochemical backbone of the DNA molecule that gives it its characteristic "double helix," or spiral staircaselike structure;
- Removing either the altered portions of DNA bases or whole bases which had been altered by reactions with potentially carcinogenic agents such as nitrosamines. Nitrosamines and other carcinogens have the ability to change the biochemical makeup of the bases and thus lay the groundwork for faulty directions that can lead to uncontrolled cell growth; and
- Excising single-strand sections of DNA where relatively bulky carcinogens (like polycyclic aromatic hydrocarbons) so distort the strand's conformation that it can no longer function.

One indication of the importance of DNA repair processes in the control of carcinogenesis is the increased cancer incidence observed in patients born with syndromes associated with DNA repair deficiencies (Cleaver 1980). Examples of such diseases are

- Xeroderma pigmentosum, a disease in which ultraviolet rays in sunlight lead to tumors of the skin and cornea (Cleaver 1969);
- Ataxia-telangiectasia, a disease associated with tumors that usually affect one side of the brain (German 1972; Taylor et al. 1975); and
- Fanconi's anemia, a rare disorder characterized by deficiency of all cell elements of the blood, underdevelopment of the bone marrow and associated musculoskeletal and genitourinary anomalies (Poon 1974).

The increased cancer incidence seen in these patient populations is not surprising because exposure to some DNA-damaging agents—such as the ultraviolet rays in sunlight or forms of nitrosamines which occur naturally in our bodies—is all but unavoidable (Tannenbaum et al. 1977).

The first indication that chronic alcohol consumption might impair one of the DNA repair pathways involved experiments in which different carcinogens, including nitrosamines, were administered to ethanol-fed rats and control rats. The results of these studies suggested that chronic ethanol consumption impaired the activity of the DNA repair enzyme 0^6 MeG transferase (Mufti et al. 1981).

But how does one determine that alcohol itself directly inhibits DNA repair performed by 0^6 MeG transferase? For these studies we utilized an in vitro system that allowed us to quantify the repair activity of the 0^6 MeG transferase and to detect the inhibition of 0^6 MeG transferase repair activity at ethanol concentrations which are comparable to those concentrations found in blood following ethanol ingestion (Breeden 1984). The results of these experiments indicate that ethanol (as well as methanol) inhibits the activity of the DNA repair enzyme, 0^6 MeG transferase (Farinati et al. 1984).

In order to gain some understanding of possible mechanisms, kinetic studies have been conducted that suggest that ethanol may actually react at the substrate binding site of the enzyme. In other words, alcohol may bind with the enzyme in such a way that the enzyme is "locked out" of binding with the specific alkylated portion of the DNA molecule—namely, the guanine base—and, so, cannot perform the necessary repair function.

We also have studied the possible reversibility of DNA repair inhibition using laboratory animals. The results of these experiments indicate that at least a fraction of the enzyme's capacity to perform repair functions is irreversibly lost. This would suggest that ethanol either irreversibly bonds to the repair enzyme or in some other way irreversibly denatures the enzyme. There is some question as to whether low levels of acetaldehyde, the first product of ethanol metabolism, may be responsible for this irreversible loss. This, in fact, may be significant in vivo (Nomura and Lieber 1981; Stevens et al. 1981). There also is experimental evidence that 0^6 MeG transferase may be overly sensitive to activation by aldehydes, a large class of organic compounds that includes acetaldehyde and formaldehyde. Graftstrom and colleagues (1985), for instance, observed that formaldehyde inhibited the repair of 0^6 MeG residues in cultured human cells.

What remains to be determined is whether ethanol also inhibits human 0^6 MeG transferase activity. If it does, such an inhibitory effect of ethanol on 0^6 MeG transferase activity would be a likely contributing factor in ethanol's ability to act as a cocarcinogen. ☐

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Turn to page 73 for references.

A staff fellow at the National Institutes of Health examines a model of a DNA molecule.

Photo courtesy of the National Institutes of Health

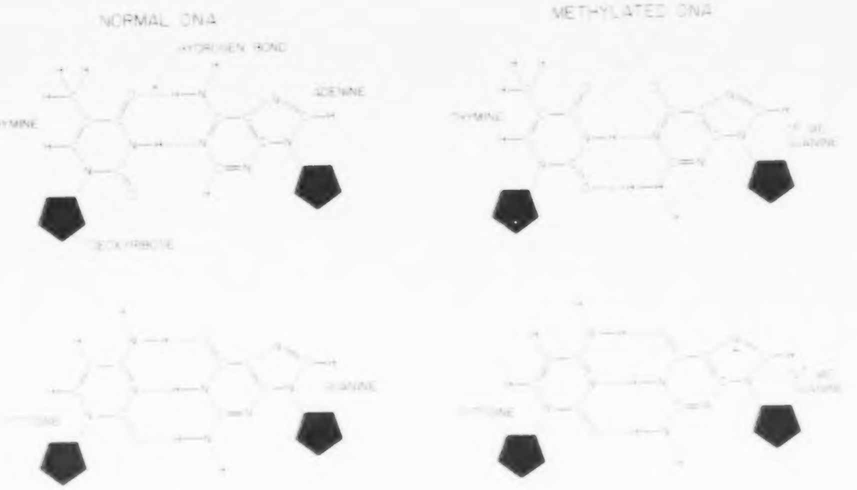

Figure 1. Diagramatic illustration of a guanine-cytosine and an adenine-thymine base pair and the effect of methylation at the O^6 or N^7 position of guanine. Methylation at the O^6 position allows guanine to base pair with thymine which may be expressed as a mutation. Methylation at N^7, while not interfering directly with base pairing, does destabilize the guanine nucleoside and may lead to a break in the guanine deoxyribose bond.

Alcohol and Tobacco Consumption as Risk Factors for Cancer

G. David McCoy, Ph.D.
Kristine Napier, M.P.H.

***Editor's note:** The following article reports associations between alcohol and tobacco consumption in the development of head and neck cancers in humans. The article has been edited for our readers. Those who wish more technical information concerning this research should contact Dr. McCoy at Case Western Reserve University School of Medicine, Department of Environmental Health Sciences, Cleveland, OH 44120.*

Beginning with the classic studies of Wynder and colleagues (1956), 30 years of retrospective and prospective epidemiologic studies have shown that the incidence of and mortality from cancers of the head and neck have increased significantly, particularly for males who are heavy users of both tobacco and alcohol (Graham et al. 1977; Rothman and Keller 1972; Schmidt and Popham 1981). In fact, the American Cancer Society predicts that there will be 50,500 new cases and 22,000 deaths in 1986 from cancer of the head and neck (American Cancer Society 1986).

It has been suggested that alcohol consumption without the use of tobacco increases the risk for cancers of the head and neck; however, few heavy drinkers are nonsmokers, making it difficult for researchers to clearly establish the role of alcohol by traditional epidemiological means (Tuyns 1983). Still, the definite association of heavy use of alcohol *and* tobacco with increased risk for cancers of the head and neck makes cancers in these sites among the most preventable in humans.

A Correlation Between Heavy Drinking and Smoking

Many studies have reported a high correlation between heavy drinking and cigarette smoking (Griffiths et al. 1976; Maletzky and Klotter 1974; Rothman and Keller 1972). Walton (1972) conducted one of the first studies to quantify the degree of association between smoking and drinking in an investigation that compared 130 alcoholic men hospitalized for alcohol withdrawal to 100 nonalcoholic psychiatric outpatients. About 94 percent of those in the alcoholic group smoked one or more packs per day, but only 46 percent of the nonalcoholics smoked that much.

The smoking-drinking association was also substantiated by a study that compared male and female alcoholics enrolled in an army drug and alcohol program to nonalcoholic army personnel and their relatives (Maletzky and Klotter 1974). The alcoholics smoked an average of about 49 cigarettes daily, but the nonalcoholics smoked only about 13 cigarettes per day. The researchers found a high correlation between the number of cigarettes smoked and the grams of alcohol consumed daily by alcoholics and a very small association for the nonalcoholic control group. An additional study showed that smoking increases as drinking increases (Griffiths et al. 1976). No alcoholics abstained from smoking, but 29 (or 58 percent) of the control subjects were nonsmokers. When only the smoking controls were compared to the alcoholics, controls were found to smoke significantly less than alcoholics. Female alcoholics also smoked significantly more than female nonalcoholics, an average of 51 cigarettes per day compared with the nonalcoholics who smoked about 11 cigarettes daily.

Why Do Many Drinkers Smoke?

Numerous reasons have been advanced to account for increased smoking by drinkers. One explanation for increased smoking by drinkers is a strong underlying oral drive. This is supported by early data correlating heavy coffee consumption with smoking and drinking (Heath 1958; McArthur et al. 1958). However, several lines of evidence suggest that an oral drive is not responsible for the drinking-smoking association. Alcoholics who had successfully stopped drinking demonstrated no appreciable increase in smoking. In fact, some even smoked less during ethanol abstinence (Griffiths et al. 1976; Maletzky and Klotter 1974; Rothman and Keller 1972). If an oral drive were responsible, then an increase in smoking would be expected during periods of alcohol abstinence.

Still another early theory advanced the idea of an association between drinkers smoking more and increased frequency, probability, and duration of social contacts (Diethelm and Barr 1962; Doctor and Beernal 1964). A later study, however, contradicted the notion, based on data showing that alcoholics who drank alone smoked just as much as alcoholics drinking with others (Griffiths et al. 1976).

Another possible explanation for the drinking-smoking association is a bio-

G. David McCoy, Ph.D., at his laboratory at Case Western Reserve University. The model (inset photograph) shows anatomical structures of the head and neck.

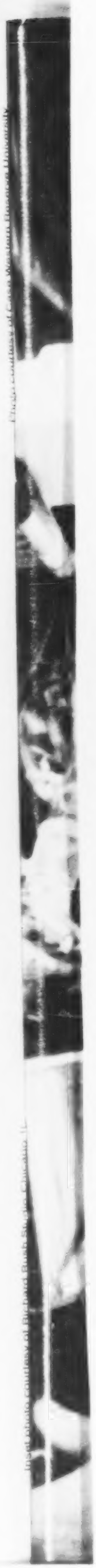

Photo courtesy of Case Western Reserve University

Inset photo courtesy of Richard Rush Studios, Chicago, IL chemical one. Drinkers may smoke more than nondrinkers because of a greater physiological need for more nicotine than nondrinkers. Nicotine, the main psychoactive component of tobacco (Lyon et al. 1975), is a potent chemical which initially produces an excitatory effect on the portion of the nervous system that regulates the heart muscle. As levels of nicotine in the blood decreases, tremors can occur (Dodson and Johnson 1979). In order to maintain the excitatory effects of nicotine, smokers must maintain a certain blood level of nicotine (Goldfarb et al. 1976), an important stimulus for continued cigarette smoking. Interestingly, rats pretreated with ethanol were found to clear nicotine from the blood more quickly than rats receiving no ethanol (Adir et al. 1980). Ethanol, it was found, caused on overall decrease in plasma levels of nicotine and its metabolites, which ultimately suggests that ethanol induces nicotine metabolism. This research implies that drinkers must smoke more to maintain blood nicotine levels upon which they have become dependent.

Alcohol, Tobacco, and Cancer

As stated previously, epidemiological studies have clearly demonstrated a strong positive association between habitual alcohol and tobacco consumption, and cancer. Though the connection is not clearcut, diets deficient in specific vitamins (C, B_2, A) are also associated with increased risk for esophageal cancer.

The reasons for increased risk for cancer of the head and neck among alcohol and tobacco users are unknown although several hypotheses have been advanced (McCoy and Wynder 1979), including the possibility that alcohol enhances metabolism of tobacco-associated carcinogens called nitrosamines (see article beginning on page 10). It is known that tobacco and tobacco smoke contain many distinct classes of chemical carcinogens and cocarcinogens so that, in all likelihood, some component or components in tobacco or tobacco smoke act as initiators for the carcinogenic process. It is believed that these components must be metabolized intracellularly to their ultimate carcinogenic forms before cancer can occur.

Recent studies have shown that chronic ethanol consumption by laboratory animals results in the induction of the protein (cytochrome P-450) which preferentially metabolizes tobacco-associated carcinogens called nitrosamines into their carcinogenic forms in the process called metabolic activation (Kokkinakis et al. 1985; Seitz et al. 1981; Yang et al. 1985). In addition, Lu (1979) has shown that benzo-(alpha)pyrene (BP)—a major contributor to the carcinogenic activity in tobacco smoke—can undergo metabolic activation in virtually any tissue which contains cytochrome P-450.

Ethanol administration to experimental animals has been shown to increase incidence of tumors due to BP as well as of another major class of carcinogens called N-nitrosamines.

If the alcohol consumption increases the rate of metabolic activation of carcinogens and thereby increases the likelihood of a critical alteration of cell activity leading to the initiation of cancer, then the apparent synergy, or correlated action, of alcohol and tobacco usage would be explained.

Though the temporal relationship between alcohol consumption and carcinogen administration has not yet been established, experimental studies should be able to determine whether alcohol consumption before, during, or after carcinogen exposure (tobacco smoking or chewing) is important for increased tumor incidence. While it is true that in man, alcohol and tobacco consumption in persons at risk for cancer occur together over long periods of time, an understanding of the sequence of events resulting in increased carcinogenicity should help to pinpoint and perhaps even prevent the progression of events that lead normal cells to become cancer cells.

A more complete understanding of the effect of alcohol ingestion on nicotine metabolism will be of tremendous value in the effort to explain the respective roles of alcohol and tobacco in increasing risk for cancer. If it can be shown that alcohol consumption results in enhanced metabolism and/or clearance of nicotine, thus requiring drinkers to smoke to maintain blood nicotine levels, then preventive strategies that target alcohol abuse are clearly indicated. Decreasing alcohol consumption and chronic alcohol abuse will have positive effects on decreasing the incidence of the alcohol-related cancers. In addition, recognition of the modifying effect of alcohol consumption on tobacco consumption would suggest that the success of smoking cessation programs could be enhanced if drinking habits of patients are clearly defined. Treatment of incipient alcoholism would be a necessary prerequisite for successful smoking cessation programs.

The implementation of effective preventive measures need not wait for thorough understanding of all factors that result in increased risk of cancer. Public education emphasizing all of the health consequences of alcohol and tobacco use, directed especially at the young, can and should be undertaken now. ☐

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Alcohol and Cancer of the Head and Neck

Cristina I. Cann

Numerous studies—many of which are reviewed below—have established use of alcohol and tobacco as strong risk factors for cancer of the mouth and pharynx. If the supposition that the relationship of alcohol and tobacco consumption to risk of oral cancer is, in fact, causal, these two agents together could account for approximately three-fourths of cancers of the oral cavity in U.S. males (Rothman 1975; Rothman and Keller (1972).

A number of cohort studies focusing on the incidence of deaths due to cancer among alcoholics supports the idea that alcoholics, compared with the general population, have a higher risk of developing cancer, especially cancer of the mouth or pharynx (Hakulinen et al. 1974; Monson and Lyon 1975; Pell and D'Alonzo 1973; Schmidt and de Lindt 1972).

Results of several studies in the United States have suggested that the most important risk factor for head and neck cancer among heavy drinkers of alcoholic beverages was the consumption of whiskey (Feldman and Boxer 1979; Keller and Terris 1965; Wynder and Bross 1961; Wynder et al. 1956, 1957, 1976). In fact, Wynder and Bross (1961) found that those who consumed more than 6 ounces of whiskey daily were 25 times as likely to get cancer of the esophagus as nondrinkers even after controlling for tobacco use. In comparison, the investigators found that the risk of cancer of this site among those who consumed more than 48 ounces of beer daily was 10 times that of nondrinkers.

Furthermore, the risk of developing oral cancer ranges from two to six times the risk nondrinkers face depending on—and increasing with—the amount of tobacco smoked by chronic heavy drinkers (Rothman 1975). Data gathered by Rothman and Keller (1972) indicate that the effect of alcohol consumption on risk of oral cancer appears to be much greater in smokers, which suggests a synergistic effect compatible with evidence that alcohol acts as a cocarcinogen (see article beginning on page 10). In fact, it has been estimated that the combined effect of heavy smoking and drinking results in a risk of oral cancer that is more than 15 times as great as for those who neither smoke nor drink. Heavy smoking alone results in no more than a two to threefold increase in risk of developing oral cancer.

The Cohort Studies

A cohort study focusing on the incidence of deaths due to cancer among alcoholics was conducted by Schmidt and de Lindt (1972) who, between 1951 and 1963, followed 5,395 men and 1,119 women who had sought treatment for alcoholism at the Toronto Clinic of the Addiction Research Foundation. Schmidt and de Lindt found that participants in their group were 3.4 times as likely to die of cancer of the pharynx and buccal cavity as members of the general population in Ontario. Furthermore, study participants were 5.2 times as likely to die of cancer of the esophagus, and 8.9 times as likely to die of cancer of the larynx as members of the general population in Ontario.

In another study, a 5-year followup study of employees of the Du Pont Com-

A physician examines head x rays from a cancer patient.

pany, Pell and D'Alonzo (1973) compared the causes of death between 899 alcoholics and 921 control subjects. The alcoholics showed a higher cancer mortality rate with 26 alcoholics dying of cancer compared to only 7 in the control group. Regarding cancers of the head and neck, three individuals in the alcoholic group died of cancers of the larynx and three died of cancer of the buccal cavity compared with no deaths in the control group for these sites. Alcoholics, then, showed increased risk for cancer, especially for cancer of the oral cavity, respiratory system, and genitourinary organs. In these 3 categories, there were 17 cancer deaths among the alcoholics and only 3 in the control groups.

Table 1. Estimated relative risk for laryngeal cancer according to alcohol consumption before and after adjusting for smoking history.

Shots of Whiskey Consumed Per Day (1 "shot" = 1.5 oz)	Crude Relative Risk	Relative Risk Controlling for Smoking
<1	1.0	1.0
1–6	1.9	1.7
7+	7.7	5.6

Source: Rothman et al. 1980; Wynder et al. 1956

Hakulinen and colleagues (1974) followed chronic male alcoholics registered in Helsinki as chronic misusers of alcohol between 1967 and 1970. Expected numbers of cancer cases were calculated from data provided by the Finnish Cancer Reg-

Photo courtesy of the National Institutes of Health

istry. According to those calculations, alcoholics were 5.7 times as likely to get cancer of the pharynx, 4.1 times as likely to get cancer of the esophagus, and 1.4 times as likely to get cancer of the larynx as male members of the general population.

Jensen (1980) found cancer of the pharynx, esophagus, and larynx to be increased among male members of the Danish Brewery Workers Union who received a free daily ration of 2.1 liters of beer. In fact, excess risk was found to increase with duration of employment at the brewery for cancer of the larynx, trachea, and esophagus.

Sorting Out the role of Smoking

None of these cohort studies, however, controlled for tobacco use, an activity that has been found to increase risk of head and neck cancer. A wealth of research indicates that the risk of cancer of the head and neck region increases progressively with greater alcohol consumption at each level of smoking (Feldman and Boxer 1979; Herity et al. 1981; Keller and Terris 1965; Martinez 1969; Rothman and Keller 1972; Wynder and Bross 1961; Wynder et al. 1956, 1957, 1976).

Wynder and colleagues (1956 and 1976) conducted two case-control studies that estimated relative risk of laryngeal cancer for smoking and alcohol consumption. Table 1 shows that smokers who drank more than 7 shots (10.5 oz) of whiskey daily were 7.7 times as likely to get laryngeal cancer compared with those who did not drink at that rate. After controlling for smoking, the relative risk of those who drank 7 shots of whiskey daily decreased to 5.6 (Wynder et al. 1956).

The Third National Cancer Survey (Williams and Horm 1977) recorded the cancer incidence in 7 metropolitan areas and 2 entire States between 1969 and 1971. Among subjects included in the survey, overall risk of cancer of the oral cavity and pharynx was found to be positively associated with the amount of every type of alcohol consumed (beer, wine, or distilled spirits) when controlling for age, race, and smoking habits. The dose-dependent increase in risk was less striking for cancer of the larynx in this study, however. In males, the relative risk estimates for the highest level of total alcohol consumed were 1.4 for cancer of the lip and tongue, 3.7 for cancer of the oral cavity, 6.2 for pharyngeal cancer, 1.4 for esophageal cancer, and 2.2 for cancer of the larynx. Risk of cancer of the salivary glands appeared to be increased in alcohol drinkers when controlling for race, age, and smoking habits.

Martinez (1969) conducted a community case-control study in Puerto Rico that included 138 patients with cancer of the mouth, 45 with cancer of the pharynx, and 163 with cancer of the esophagus. Controls were matched to cases by age, sex, and use of tobacco. Compared with nondrinkers, those drinking five or more units of alcohol daily (one unit of alcohol was considered to be 2 oz liquor, 18 oz beer, or 8 oz wine) were 2.8 times as likely to get cancer of the mouth, 14.7 times as likely to get cancer of the pharynx, and 7.7 times as likely to get cancer of the esophagus.

Other Sources of Alcohol

Weaver and colleagues (1979) found that in comparing 200 patients with cancer of the head and neck with a control group of general surgery patients, the cancer group used greater quantities of tobacco and alcoholic beverages. However, 11 patients with head and neck cancer were found to have abstained from all alcoholic beverages and tobacco. Another intriguing fact came to light: all except 1 of these 11 patients had used mouthwash several times daily for more than 20 years—much more than the general surgical control group. Most of the 11 had used a commercially available mouthwash that had an alcoholic content of 25 percent (most mouthwashes range from 14 to 28 percent alcohol content). Of the 11 patients with cancer who used mouthwash excessively, 9 were women, and all 11 patients had cancers involving the oral cavity.

Weaver and colleagues (1979) postulated that, in addition to high alcohol content, other constituents found in some mouthwashes (cetylpyridinium chloride, thymol, eucalyptol, phenol, methyl salicylate, and boric acid) may contribute to epithelial irritation because mouthwash is generally held in the oral cavity for a longer time than are alcoholic beverages. The epithelial irritation and inflammation may be followed by malignant changes after prolonged, repeated use of mouthwash.

The authors conclude that a much larger study group would be necessary to evaluate any contributory role that use of mouthwash might play in the genesis of cancer of the head and neck region. In fact, other investigations of the effects of mouthwash on cancer risk have found inconsistent results (Blot et al. 1983; Wynder et al. 1983).

Conclusions

The findings discussed above show that tobacco and alcohol use are undoubtedly major risk factors for development of cancer of the head and neck. Furthermore, they suggest that the two substances may interact synergistically to increase the risk of cancer of the head and neck. Therefore, intervention strategies that are successful in preventing or reducing consumption of even one of these substances could result in a decrease in the incidence of cancer of the head and neck. ☐

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Psychosocial Rehabilitation of Alcoholic Patients with Head and Neck Cancer

Jeanne Parzuchowski, R.N., M.S.

The two most common etiological factors implicated in the development of head and neck cancer are chronic exposure to alcohol and heavy use of tobacco (see article beginning on page 28).

The health professional caring for a patient diagnosed with head and neck cancer is faced with many challenges, especially when the patient also is diagnosed as having an underlying disease, alcoholism.

These cancers tend to have an especially significant psychological impact on the patient because many of these tumors, as well as the effects of the treatment, are cosmetically disfiguring and visible to others (Labayle 1980; Schaat and Carl 1974; Shedd 1976; Singer 1981; Sisson et al. 1975; Summers 1974; Traissac et al. 1980). Although remarkable advances have been made in reconstructive or plastic surgery, much of the initial surgery undergone by the cancer patient is often disfiguring. Because of the accompanying alterations in body image, it is not unusual to see in these patients, evidence of severe anxiety, avoidance of social interactions, isolation, and depression.

Telling an alcoholic patient with head and neck cancer to stop drinking at the time of diagnosis can be likened to telling a person with severe recurrent headaches to stop taking analgesics. In addition, when told that he or she must cease drinking, the alcoholic patient must not only face withdrawal from the drug but often also must face the reality—and deal with the associated guilt—that his smoking and drinking may have caused this life-threatening medical situation.

The following strategies are offered to assist the professional engaged in the psychosocial rehabilitation of alcoholics and alcohol-abusing patients suffering cancer of the head and neck. By no means should this discussion be construed as all-inclusive.

Four areas that require evaluation prior to development of a psychosocial rehabilitation program for cancer include the patient's environment, his or her socialization skills and support, education level, and individual coping style. All or only some of these areas may require attempts at modification.

Modifying the Patient's Environment

Manipulation of the patient's environment can occur through various types of direct intervention by the health care professional. The health care provider may educate the patient's relatives and friends about the disease and its management and may counsel that patient as he or she undertakes major changes in lifestyle, such as cessation of smoking and drinking, that will require support. Support may be conducive to recovery from alcoholism, and in turn, this recovery will increase the chances for successful cancer therapy.

Environmental manipulation for the severely chronic alcoholic with head and neck cancer will pose a great challenge if the patient is jobless, homeless, and friendless. Select social and religious agencies, such as the Salvation Army or the YMCA, may offer a chance at rehabilitation; their utilization, at least, will help to meet the patient's basic needs: food, shelter, clothing, work (if possible), and companionship. The Veterans' Administration is another potential source of support if the patient qualifies. Regardless of economic status, all patients may benefit from a social service consult in an attempt to identify or alleviate any potential financial concerns or stress.

Support Groups

The most successful and best known nonmedical organization that can be tapped for help to the alcoholic with head and neck cancer is Alcoholics Anonymous. AA provides support, acceptance of the alcoholic, and positive reinforcement for abstinence. Support for the alcoholic cancer patient in adjusting to what for some is a psychologically devastating diagnosis, may be given, for example, by encouraging the patient to attend structured weekend retreats sponsored by the American Cancer Society (ACS). These retreats are run by professionals who specialize in the care of cancer patients. ACS programs such as I Can Cope, or Focus on Living, use group meetings to provide mutual support, patient education, and training in effective coping strategies.

Education

Besides individual and group support, the patient should be provided with structured education. Information regarding the rationale of multimodality treatments (combinations of surgery, radiation, chemotherapy, and rehabilitation) must be included within the patient's initial focus. It is not an uncommon phenomenon for even the most educated patient to view some of the fallacies about cancer as facts. Dispelling these misconceptions should be a priority for the health professional.

Photo courtesy of Harper Hospital

Jeanne Parzuchowski, R.N. (right), explains the behavioral contracting procedure.

In a sense, patient education can be considered a form of active treatment therapy. Supplying critical information may assist the patient's adjustment to treatment and coping. It can also aid in enhancing the patient's self-esteem.

Behavioral Contracts

Use of written treatment contracts can be used to help the patient overcome self-destructive behaviors and adopt new healthy behaviors.

"Contracting" with individuals is a relatively common characteristic of reinforcement theory, and has proved successful in settings such as industry, education, and counseling (Ayllon and Aznon 1968; Beatty 1978; Cook and Skeldon 1980; Loomis and Horsley 1974; Steckel 1976; Steckel and Swain 1977; Underwood 1980). A written contingency contract is a specific, mutually negotiated agreement between the health care professional and his or her patient that identifies positive reinforcers that will be awarded the patient in return for the patient's performance of specific types of healthy behavior.

This innovative approach has proved moderately successful in assisting and reinforcing new behaviors. The emphasis on positive reinforcement and the mutual responsibility shared by the provider and the patient reinforces a healthier lifestyle and affords the patient an opportunity to regain a large measure of control over his or her life. Providing a specific, positive reward system, the contract allows for systematic reinforcement of positive patient behavior, thereby increasing the likelihood that the patient's participation will improve. Contingency contracts apply the principles of reinforcement which state that the performance of a behavior can be increased when followed closely by a favorable consequence.

Conversely, the performance of positive behavior will decrease when followed by an unfavorable or punishing consequence. The use of contracts provide visible relationships between patient and provider, and details explicit expectations of the patient's performance, thus, removing feelings that they must somehow meet overwhelming and vague goals within vague time frames.

Before contracting with a patient specifically for alcohol and smoking cessation, an informational meeting between health care provider and patient should be scheduled. At this time, the patient's level of understanding of the cancer is assessed and the correlation between alcohol and tobacco consumption and the disease is discussed. After the rewards are defined by the patient and agreed upon by the care provider, the actual contract is written with specific times set for review. Examples of some of the items chosen by alcoholic patients with head and neck cancer include lottery tickets, books, time spent talking with the nurse, free nutritional supplements, or nicotine chewing gum. A patient needs more time than is now generally available during a hospitalization to learn, adapt, and integrate such new behaviors to his lifestyle. It is possible that the technique of contingency contracting—utilized with moderate success in pilot studies by the nursing staff at the Department of Otolaryngology at Harper Hospital and at Wayne State University—will help the patient cope quicker than he or she would otherwise. The technique may also help him or her discard unhealthy behaviors such as drinking and smoking, thus improving the chances of cancer management.

The health care provider must not assume that the impact on the patient of the diagnosis of head and neck cancer will automatically motivate the patient to learn new information as well as to participate in his or her care and rehabilitation. It is highly unlikely that the patient, without motivational techniques, will be capable of processing all the information offered on head and neck cancer, or that he or she will retain much of the information about complex treatment modalities and adhere to a prescribed regimen that includes cessation of alcohol consumption. Each aspect of head and neck cancer treatment and rehabilitation involves complex new behaviors to be learned by the patient in time. Before a patient can be expected to adhere, he or she must first be willing to participate in his or her own care through the planning of therapy.

Conclusion

What can be said about the long-term prospects of psychosocial rehabilitation of the alcoholic patient diagnosed with head and neck cancer? No one knows what new treatment techniques in surgery, chemotherapy, or radiotherapy will be developed in the years to come. While advances in treatment are awaited, more effort needs to be directed toward improving the alcoholic cancer patient's quality of life and coping skills. In conjunction with medical or surgical management of the cancer, combinations of group support and education coupled with the reinforcing technique provided by contingency contracts offer a realistic and organized approach to providing optimum treatment and rehabilitation for alcoholic patients with head and neck cancer. ☐

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Turn to page 74 for references.

Alcohol Consumption and the Risk of Breast Cancer

Doug M. Podolsky

Although lung cancer has now surpassed invasive breast cancer as the leading cause of cancer deaths among American women, breast cancer is still the most common type of cancer to strike women in the United States. At the present rate, about 9 percent of all women in this country—approximately 1 in every 11 women—will develop breast cancer at some time in their lives (NCI 1984). That breast cancer is one of the largest single causes of female cancer deaths in this country underscores the importance of research into the etiology of breast cancer and the identification of risk factors to help predict its occurrence.

Three major risk factors for breast cancer include age (50 years and older), family history of breast cancer and personal history of breast cancer. Other factors that carry varying degrees of risk for breast cancer include reproductive history, menstrual history, benign breast disease, exposure to large doses of radiation, and nutrition (high dietary fat intake may contribute to increased risk) (U.S. Department of Health and Human Services 1985). These and many other risk factors of breast cancer have been investigated but only recently has attention been paid to the consumption of alcoholic beverages as a risk factor for breast cancer.

One of the first case-control studies in which researchers investigated this possible relationship was conducted by Roger R. Williams and John W. Horm (1977) of the National Cancer Institute. The two investigators analyzed data from the Third National Cancer Survey (TNCS) that provided quantitative data on, among other variables, the drinking and smoking habits of 7,518 persons diagnosed as having cancer.

Associations between alcohol and the development of cancer at several sites in the body were found in analyses controlled for age, race, and smoking status. Among the results of the study, Williams and Horm found that women with breast cancer had significantly higher alcohol intake than women with other cancers. The investigators noted the "unexpected positive associations" between the reported consumption of wine, beer, and hard liquor with cancer of the breast. The investigators analyzed data from 1,127 breast cancer cases and calculated that the relative odds of a drinking participant having breast cancer ranged from 1.2 to 1.6 times greater than that of a nondrinker in the study.

In a report based on the TNCS findings, Williams (1976) theorized a mechanism by which an alcohol-induced pituitary secretion of certain hormones promoted breast cancer. Specifically, Williams suggested that alcohol stimulates secretion of prolactin and other hormones from the pituitary gland in the brain. Prolactin, as its name suggests, stimulates and sustains lactation. Williams based his theory, in part, on a study by Hobbs and colleagues (1975) who had reported that prolactin may promote tumor growth in 5 to 10 percent of breast cancer patients. This hormonal theory is far from universally accepted, however. Other human studies have shown no difference in the basal levels of serum-prolactin between breast cancer patients and controls (Mittra et al. 1974; Wilson et al. 1974). No biological mechanism yet suggested that would adequately explain why alcohol consumption might increase one's risk for developing breast cancer has won wide support.

Today, the supposition that alcohol consumption is a risk factor in breast cancer remains controversial. Although some case-control studies have pointed to an association between drinking and the likelihood of breast cancer (Le et al. 1984; Rosenberg et al. 1982; Talamini et al. 1984; Williams and Horm 1977), other studies have failed to show an association (Bain et al. 1984; Begg et al. 1983; Byers and Funch 1982; Paganini-Hill and Ross 1983; Webster et al. 1983). It is not immediately clear why findings differ so widely.

The Boston University Study

One study that did suggest a link between alcohol consumption and increased risk of breast cancer was conducted by Lynn Rosenberg and her colleagues (1982) at Boston University School of Medicine. The investigators conducted a large case-control study in which the consumption of alcoholic beverages by women with breast cancer was compared with that of women with cancers of other sites and with that of women with nonmalignant disorders. The results suggested that women who drank experienced a rate of breast cancer about 1.5 to 2 times that of women who abstained. Further, the estimated increase in the risk was greater (although not significantly so) for those who had drunk most frequently.

The study included interviews with 1,152 women with breast cancer and patients in two control groups—composed of 519 women with endometrial or ovarian cancer and 2,702 females with nonmalignant disorders—in hospitals in several

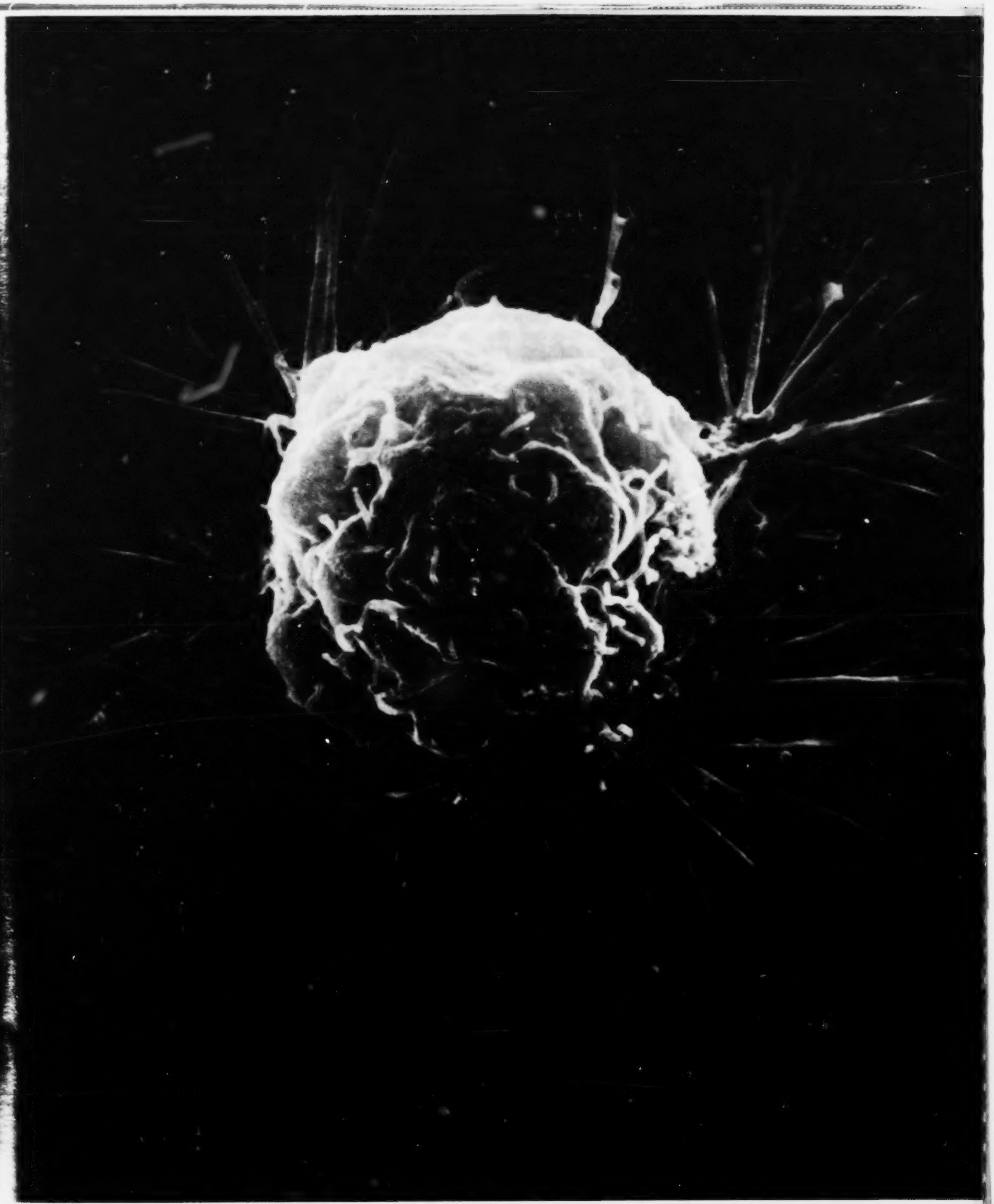


Photo courtesy of the National Cancer Institute

A scanning electron micrograph of a cell from human breast cancer tissue. The dramatic features on the cell surface are not unique characteristics of cancer cells. Rather, they are caused by methods used to prepare the cell for examination.

areas of the United States, Canada, and Israel. All interviewed women who met the following criteria were included as "cases":

- A diagnosis of breast cancer (first made during the year before the current admission);
- No other primary cancer or history of cancer of other sites; and
- Ages 30 to 69 years.

Two control groups were enrolled consisting of patients 30 to 69 years of age who had a primary diagnosis that, the investigators judged, was unrelated to the consumption of alcoholic beverages. The first group included 519 patients—334 with endometrial cancer (the cancer of the lining of the uterus) and 185 with ovarian cancer. In this group, 77 percent of the patients with endometrial cancer and 82 percent of those with ovarian cancer, said that they drank.

The second control group consisted of 940 patients who had a primary diagnosis of disc disorder, 489 with acute infection or appendicitis, 390 with uterine fibroids, 332 with benign skin disorder, 207 with hemorrhoids, 193 with hernia, and 143 diagnosed as having ovarian cysts. In this group of controls, 75 percent said they drank. The lowest proportion of drinkers (71 percent) was among women with primary disc disorders, and the highest (80 percent) was among those with skin disorders.

The data were collected by nurse-interviewers who used a standard questionnaire to obtain information including each patient's medical and reproductive history, and drinking and drug use habits. During the course of the interview, each patient was asked whether she had consumed alcoholic beverages during the previous year, before that, or had never drunk at all. Subjects who had consumed alcohol in the previous year were then asked if they drank less than 4 days a week, or 4 or more days a week, and to tell the type of beverage usually consumed (beer, wine, spirits, or more than one type). Because data were not collected on the quantity of alcohol consumed, detailed evaluation of possible dose-response effects was not possible. Because no lifetime histories of alcohol use were collected in the study, the possibility cannot be ruled out that fear of a cancer diagnosis had induced some patients with breast cancer to drink or to increase their drinking. Similarly, it is possible that longstanding illnesses among the control subjects with nonmalignant disorders caused them to avoid alcohol, the authors suggested.

The estimated relative risk of breast cancer for women who did drink relative to those who had never drunk was 1.4 when the control group of endometrial and ovarian cancer patients was used for comparison; and 1.9 when the control group of patients having nonmalignant disorders was used.

"The lower estimate using cancer controls may be because cancers of the breast, endometrium, and ovary have several risk factors in common, and a comparison confined to subjects with gynecological cancer may serve to control unidentified confounding factors," Rosenberg stated. "Alternatively, alcohol consumption may be associated with endometrial or ovarian cancer as well as with breast cancer." The number of subjects with endometrial or ovarian cancer, however, was too small for separate evaluation of their possible relation to alcohol consumption.

Drinking With Meals As a Possible Risk Factor

Results of another large case-control study conducted by Monique G. Le and colleagues (1984) at the Institut Gustave Roussy in France also suggested an association between alcohol consumption by women and a heightened risk of developing breast cancer. The investigators found an association between "regular consumption of alcohol with meals" and breast cancer in a matched breast cancer case-control study of alcohol consumption involving 1,010 women with breast cancer and 1,950 women with nonmalignant diseases. The relative risk of breast cancer for women drinking alcoholic beverages with meals compared with nondrinkers was 1.47 allowing for classical risk factors (including such things as age at the birth of the first child).

Based on detailed information on alcohol consumption from 500 cases and 945 controls, the investigators were able to determine that the risk of breast cancer was greater for drinkers—especially of beer and wine—than for nondrinkers. Furthermore, the risk was found to increase as consumption of alcohol also increased, Dr. Le reported.

The information was collected in 66 private surgical clinics between October 1976 and May 1980. Patients whose diagnosis of primary breast cancer was made less than one year before the interview served as "cases." Controls consisted of patients scheduled for surgery to manage nonmalignant disease. Each breast cancer case was matched with two controls for age at interview (within 5 years) and clinic at which treatment was administered. The mean ages of cases and controls were 58.2 and 58 years.

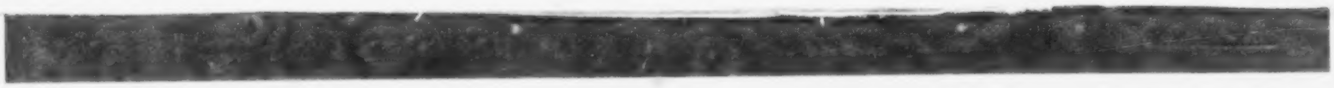
All patients were asked to complete a questionnaire. Until January 1978, the only question about alcoholic beverage consumption included on the questionnaire was, "What do you usually drink with your meals?" (There were no questions about quantity). However, since February 1978, detailed questions on alcohol consumption were added, including number of daily or weekly drinks by category of alcohol. Also, a question was added on the daily number of cigarettes smoked. The data were validated and analyzed by multivariate logistic regression methods for matched case-control studies.

The results of the study suggest that the risk of developing breast cancer was significantly increased only for women who drank moderate amounts of beer or wine every day but that there was no significant increased risk noted for those who drank higher amounts of hard liquor. This led the investigators to theorize that if an effect of alcohol on the risk of breast cancer does exist, as the study suggests, there might be a threshold to this effect—or the effect might exist only after a long period of daily and moderate alcoholic beverage consumption.

In fact, women in the study consumed smaller amounts of alcohol than most women nationally (in 1977). The mean weekly consumption in terms of pure alcohol by study participants was 73 grams for controls and 86 grams for cases, as compared with 106 grams for the French national average as estimated by a survey conducted in 1978 by the Institut de Recherches Scientifiques Economiques et Sociales. Analysis of the average weekly amount of alcohol consumed by drinkers only showed that the amounts consumed by participants in the study were also smaller than the national average: 108 grams for controls, and 119 grams for cases as compared with 189 grams for French women drinkers.

In other words, women with breast cancer drank more than the hospital controls did—but the controls drank considerably less than the national average for women—a result that could have the effect of exaggerating the estimate of risk.

There is, then, some advantage to followup studies in which drinking habits of participants are documented at the outset of the investigation and patients are



then followed over time to see who is later diagnosed as having breast cancer.

Heightened Risk at Three Drinks a Day?

The results of one investigation from a Californian health care population (Hiatt and Bawol 1984) suggest a heightened risk for breast cancer among women who consume three or more alcoholic drinks per day. Robert A. Hiatt and Richard D. Bawol of Kaiser-Permanente Medical Care Program in Oakland, CA, began their investigation at about the same time that Boston University School of Medicine investigators (Rosenberg et al. 1982) reported that alcohol consumption might double the chance of breast cancer developing in women who drank compared to nondrinking women. Hiatt and Bawol had just completed a large cohort study of breast cancer incidence focusing primarily on the predictive effect of serum cholesterol level.

In that study (Hiatt et al. 1982), the investigators also examined alcohol consumption among 95,000 women who were members of the Kaiser Foundation Health Plan of Northern California. Though they did not emphasize the finding at the time, the authors reported a statistically significant trend of increased risk of breast cancer with increased level of alcohol consumption.

Stimulated by the findings of Rosenberg and others, Hiatt and Bawol reexamined the stated alcohol consumption for each of the 1,169 breast cancer cases among the 88,477 women who had answered at least some of the questions on alcohol consumption during screening examinations between 1964 and 1972. They found the incidence of breast cancer in this cohort greater for women who drank. Furthermore, among these drinkers, the incidence increased in an irregular trend with heavier alcohol consumption rates. The findings further suggested that consumption of three or more alcoholic drinks per day may increase the chance of breast cancer.

Although only about 5 percent of the population studied stated that they routinely consumed three or more alcoholic drinks per day, they had a "significantly elevated relative risk" of developing breast cancer (a rate 1.4 times that of nondrinkers) despite controls for confounding variables such as age, race, education, and many other variables. (No significant interaction effect of smoking and alcohol was found.)

Because women who had fewer than three drinks per day had no increased relative risk over nondrinkers, the results of this study might be explained either by an unrecognized carcinogenic effect of alcohol on breast tissue or by the confounding effect of other factors associated with heavy alcohol use, the investigators surmised.

The Italian Studies

Another study also offers some support for the notion that heavy drinking predisposes one to breast cancer. Talamini and colleagues (1984) found a seventeenfold increase in risk among a small group of Italian women who drank more than one-half liter of wine each day. The study was one of the few analyses that took into account the possible distortion of the effect of alcohol by other elements of the diet. Still, this adjustment increased the estimated risk, especially among the heaviest drinkers.

In another recently published report by Italian investigators on the relationship between alcohol consumption and the relative risk of breast cancer, Carlo La Vecchia and colleagues (1985) at the Institute for Pharmacological Research in Milan examined data from a case-control study at university and general hospitals in the Greater Milan area where information was available on duration of alcohol consumption and on a number of dietary factors.

Beginning in January 1983, interviewers identified women admitted for breast cancer and for a wide spectrum of other conditions to participate as cases or controls. A standard questionnaire was used to obtain information on personal characteristics and drinking habits, gynecologic and obstetric data, related medical history, and history of lifetime use of oral contraceptives or other female hormones. The subjects were asked whether they drank, the average number of days per week they drank, the average number of drinks per day, and the duration in years of any drinking habits. Data were also collected about the frequency of consumption per week of 14 dietary items including milk, cheese, and other major sources of animal fat and vitamin A (liver, carrots, green vegetables, and fruits).

The cases studied through June 1984 included a total of 437 women, ages 26 through 74 years, with histologically confirmed breast cancer diagnosed within the year prior to the interview. The 437 control patients—women who had diseases other than malignant, hormonal, or gynecologic disorders—were matched for age in decades.

The proportion of women who consumed alcoholic beverages was greater among the cases (77 percent) than among their age-matched controls (72 percent). Drinking habits were broadly comparable within the diagnostic categories of controls (traumatic, nontraumatic, orthopedic, and other).

The estimated relative risk of breast cancer for women who reported they consumed one to three glasses of wine per day was 1.24 times that of nondrinkers (the amount of absolute alcohol in a 4 oz glass of wine is about 0.5 oz). For women reporting more than three glasses of wine per day the relative risk was 1.93 times compared with nondrinkers. Relative risk was only slightly above 1.0, or unity, for drinkers of beer and hard liquor.

The investigators were unable to show that this association was incidental, since simultaneous allowance by means of multiple regression for the major risk factors for breast cancer (including a few dietary items potentially related to breast cancer risk) did not materially modify any of the relative risks.

In conclusion, there have been few animal model experiments on the relation of alcohol use and breast cancer (Schrauzer et al. 1979, 1982). Admittedly tentative conclusions about a possible association between alcohol consumption and increased risk of breast cancer are therefore based upon human evidence gathered through epidemiologic and case-control studies ("Does alcohol," 1985). And although the results of key studies reviewed here suggest that there may be some relationship between alcohol consumption and the incidence of breast cancer, the supposition is still controversial—little or no association emerged in several U.S. reports (Begg et al. 1983; Paganini-Hill and Ross 1983) including one report based on a large study from the Centers for Disease Control where alcohol consumption was one of the items specifically investigated (Webster et al. 1983).

But if the association between alcohol consumption and risk of breast cancer is real, says Robert Hiatt of Kaiser-Permanente, the relationship would be an important one given the high incidence of breast cancer and the generally weak capacity of risk factors to predict its occurrence (Hiatt and Bawol 1984). ☐

Doug M. Podolsky*, a member of NCALI's materials development staff, is managing editor of* Alcohol Health and Research World.

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Alcohol and Cancer Prevention Awareness

Joan F. Houghton, Ed.D.
Rose Mary Romano, M.A.
Doug M. Podolsky

Editor's note: *A national survey conducted by the National Cancer Institute (NCI) showed clearly that perceptions about cancer have failed to keep pace with the progress of medical science (NCI 1984c). Almost half the respondents in this survey failed to identify individual action as a way to reduce cancer risk. More than 45 percent agreed with the statement, "There isn't much a person can do to prevent cancer." The following article describes NCI's ongoing Cancer Prevention Awareness Campaign and focuses on the alcohol-cancer messages the campaign presents.*

Research shows that environmental factors, including lifestyle, are associated with about 80 percent of all cancers. In addition to tobacco use and poor dietary habits, chronic or excessive use of alcohol, especially in conjunction with smoking, increases the risk of developing certain types of cancers. To inform the public about ways to reduce cancer risk, the National Cancer Institute launched a Cancer Prevention Awareness Program. The Program includes messages related to cancer and alcohol consumption.

Based on scientific evidence, the National Cancer Institute identified seven risk factors, which, if heeded, would substantially reduce an individual's risk to cancer. The major risk factor associated with cancer and its prevention is tobacco. Diet is another important risk factor addressed by the Cancer Prevention Awareness Program. The other risk factors include alcohol, radiation, estrogens, occupational exposure, and viruses. While tobacco use and dietary habits have the greatest effects on cancer risk, scientists generally agree that cancer would be largely avoidable if individuals made choices which reduced their exposures to all potentially harmful agents. Strong epidemiological evidence exists linking chronic or excessive alcohol consumption, or factors associated with it, to an increased risk of certain types of cancer, including cancer of the mouth, pharynx, larynx and esophagus. Alcohol may also increase the risk of cancer of the liver, pancreas, stomach and large bowel. This is particularly true when alcohol is consumed in combination with cigarette smoking.

Epidemiological data attributes approximately 3 percent of all U.S. cancer deaths to alcohol. In one study, heavy smoking and drinking were estimated to increase the risk of oral cancer to as much as 15 times that of persons who neither smoke nor drink. By contrast, heavy smoking alone increased the risk only two or three times. Drinkers who do not smoke have less risk than drinkers who smoke.

Alcohol consumption, particularly if chronic or excessive, often leads to nutritional deficiencies. It is estimated that 75 percent of alcohol-related cancers may result from the combined effects of poor nutrition, alcohol, and smoking (NCI, 1984*a*).

The Cancer Prevention Awareness Program is designed to translate this and other scientific evidence into information that will enable individuals to make vital behavioral changes. The educational objectives of the Cancer Prevention Awareness Program are aimed at improving public knowledge, attitudes, and beliefs regarding cancers—factors that interact to produce an individual's health-related behavior. By informing the public of cancer risks, the program is intended to encourage people to reduce their own risk of cancer by adopting a healthful lifestyle. While knowledge alone cannot ensure attitude or behavior change, research shows that well-planned information programs can achieve realistic behavior change objectives (Rice and Paisley 1981).

In NCI's prevention awareness program, messages have been developed around a positive "good news" theme to make people aware that cancer is preventable, to create awareness about cancer risks, and to inform people about actions they can take to reduce personal risk. The approach is intended to minimize the fear and fatalism often associated with cancer. Public attitudes about cancer are more likely to improve when people are made aware of the progress that has been made in treatment and survival and are informed about how they can exert some control over their own exposure to risk factors (NCI 1984*b*). Thus, the program focuses on primary prevention and presents messages about actions that will reduce the likelihood that cancer will develop.

To determine effective approaches for information dissemination and educational programming, the NCI conducted a national survey of public perceptions of cancer, cancer risk, and cancer prevention (NCI 1984*c*). The study showed that perceptions about cancer have failed to keep pace with the progress of medical sciences. Almost half of the respondents in this survey failed to identify individual prevention as a way to reduce cancer risk.

More than 45 percent agreed with the statements, "everything causes cancer" and "there is not much a person can do to prevent cancer."

NCI's Cancer Prevention Awareness Program, therefore, operates amid what appears to be widespread public pessimism about cancer and confusion about cancer risks. Using specific cancer prevention messages, the program seeks to clarify the concept of cancer risk and to dispel the misconception that there is nothing an individual can do to prevent cancer. In addition, the messages provide specific actions people can take to reduce their cancer risk, such as the following:

- Don't smoke or use tobacco in any form.
- Eat a balanced diet that includes lots of fresh fruits and vegetables and whole grain cereals. Eat foods that are high in fiber and low in fat.
- Avoid unnecessary x rays.
- Protect yourself against exposure to hazardous substances on the job by using protective clothing such as masks, respirators, or other protective devices.
- Minimize exposure to bright sunlight by using chemical sunscreen or wearing protective clothing.
- Take estrogens only as long as necessary.
- If you drink alcohol, do so only in moderation (no more than two drinks a day).

The National Cancer Institute depends on health professionals to assist in delivering the cancer prevention messages and encouraging individuals, particularly those at high risk, to make behavioral changes which will improve one's overall health status. Because physicians are generally considered to be the single best, most reliable, and credible source of health information, they can influence patients to make positive behavioral changes and thus reduce cancer risk (McDill 1974; Weinberg and Andrus 1983). Other health professionals, such as nurses, nurse practitioners, occupational health specialists, and pharmacists, also have special roles to play in disseminating cancer prevention information and encouraging healthful behaviors among their patients.

The Cancer Prevention Awareness Program is being implemented in two phases.

Photo courtesy of National Institutes of Health

Initially, the campaign relied primarily on the mass media to create public awareness that cancer is preventable and that individuals can take steps to reduce their own risks. During the second phase, emphasis moved from the general public toward higher risk populations. For instance, last spring a cancer prevention awareness program was targeted toward Black Americans. Program messages emphasize ways to reduce cancer risk. Throughout the campaign, members of the medical profession are engaged to help educate patients about the active role individuals can play in their own health care and about changes in one's behavior and habits that can help decrease the risk of developing cancer.

Alcohol, Cancer, and Nutrition Messages

The roots of the Cancer Prevention Awareness Program grew from the advice of many individuals, representing a wide diversity of organizations. Thirteen working groups, formulated around each of the seven risk factors and the high risk groups, critiqued program concepts and rendered opinions about program messages, approaches, and strategies. Their recommendations served to determine the nature, scope, and direction of the program.

The Alcohol and Cancer Prevention Working Group offered a wide-range of recommendations regarding the alcohol message. Nancy Kaufman, R.N., who served on the group, suggested presenting the alcohol-and-cancer message as part of a nutrition message to reduce chances of frightening the public. Kaufman, deputy director of the bureau of community health and prevention at the Wisconsin division of health, believes that incorporating alcohol and nutrition messages about cancer would help alcohol educators to win the public's attention. Because people who abuse alcohol often consume as much as 50 percent of their daily calories as alcohol, poor nutrition can also contribute to the development of drinking-related cancers. A variety of alcohol treatment programs are already showing a tendency to include diet and nutrition as part of the health information emphasis.

The Cancer Prevention Awareness Program presents the following message: "Based on evidence gathered from both laboratory and epidemiologic studies, it is possible to reduce our risk of developing cancer by making some changes in our diet. Changes in diet could make a big difference. A diet that would help reduce the risk of cancer would also contribute to good general health and adequate nutrition." The following dietary guidelines are recommended:

- Increase fiber intake by eating whole grain breads and cereals and fresh fruits and vegetables;
- Reduce the amount of fats and oils. Eat fish, poultry, lean meats and low-fat dairy products;
- Increase intake of fruits and vegetables containing carotenes and vitamin C;
- If you drink alcohol, do so only in moderation; and
- Maintain proper body weight (NCI 1984*d*).

The "cancer prevention diet" is "consistent with good nutritional practices" and is in accordance with the dietary guidelines recommended for Americans by the Department of Health and Human Services (NCI 1984*d*; USDHHS 1985). The prevention diet is also consistent with the dietary recommendations of the National Academy of Sciences (1982), the American Cancer Society, and the American Heart Association's recommendations to reduce the risk of heart disease and stroke (NCI 1984*c*).

Alcohol and Smoking Cessation Messages

The connection between alcohol and cancer is also used to support existing alcohol reduction and smoking cessation messages, explains Howard Blane, Ph.D., another member of NCI's alcohol-cancer working group and professor of epidemiology at the University of Pittsburgh.

The message on the combined effects of smoking and exposure to alcohol presented by the Cancer Prevention Awareness Program is this:

> "The hazards of exposure to some substances are greatly multiplied by smoking. Heavy drinkers who smoke have a much higher incidence of oral and esophageal cancers than do those who only smoke or drink. Smoking also dramatically increases the risk of cancers from exposure to asbestos."

Target Audiences

Successful health promotion campaigns aim at very limited changes in behavior, says Joan Lorenson, assistant director of the Bureau of Professional Development at the New York State Division of Alcoholism and Alcohol Abuse. Although nutrition messages have been ignored in the past because they demand extensive lifestyle changes, she believes they have a better chance of succeeding in today's climate in which wellness is emphasized if tied to general health promotion and fitness trends. Indeed, the NCI agrees. It is linking the alcohol-cancer message with a nutrition and general health approach that can be used to reach adults, and messages about lifestyle changes that can be used for younger people.

Chronic heavy drinkers (those who consume five or more drinks daily) are an obvious target audience for a future alcohol-cancer prevention campaign. Messages to this target audience can be developed that are specific to those who end up in treatment or to those who don't receive treatment. Another potential target group is made up of young drinkers who often have high intake but drink less frequently than other drinkers.

Clay Roberts, president of Roberts, Fitzmaham and Associates (Seattle, WA) and a member of the NCI working group, says that the military community also is an excellent target group. The U.S. Department of Defense is, in fact, planning an alcohol and drug abuse prevention program that includes military dependents stationed here and abroad. The military has concentrated on treatment in the past, but now that its treatment programs are in place, it is turning attention to prevention strategies.

Barriers to Alcohol and Cancer Prevention Messages

"Don't drink and drive" is an alcohol message that is clearly understood by the public because the consequences of drinking and driving are well known. However, messages on the alcohol-cancer link can be met with resistance, initially at least, because some segments of the public may react as if the message were simply another example of "everything causes cancer" simplism.

The "denial" factor may also be a potential problem, because many members of the public may "tune out" when cancer is mentioned. Conversely, the fear of cancer itself may stimulate interest; however, the fear element is not considered effective in cancer messages because there is no one thing that can be done to "fix" the feared situation.

Because promoting risk reduction means promoting an intangible benefit, it is important to emphasize, wherever possible, tangible benefits associated with cancer prevention behaviors. These tangibles include specific things that individuals can do to reduce their risk of getting cancer. By taking a health promotion approach and by emphasizing tangible healthful benefits one is better able to overcome the barriers of denial, fear, and fatalism toward cancer.

In introducing the cancer prevention messages in its booklet "Good News, Better News, Best News," the NCI combined positive information, warm, bright colors, and simplicity of style to overcome these barriers. The GOOD NEWS is that, "Everyone does not get cancer. Two out of three Americans never will get it." The BETTER NEWS, "Every year more and more people with cancer are cured." The BEST NEWS is that, "Everyday you can do something to help protect yourself from cancer."

Getting the Message Out

Messages that include alcohol as one of the major risk factors for cancer are being presented in the first phase of the Cancer Prevention Awareness Program targeted to the general public and are being disseminated primarily through mass media channels. Radio and television public service announcements (PSAs) were produced to create awareness of cancer risk factors and to announce the availability of the cancer prevention booklet, "Good News, Better News, Best News: Cancer Prevention," and to provide listeners with the toll-free Cancer Information Service telephone number 1-800-4-CANCER. The booklet and the PSAs are being produced in both English and Spanish. Other electronic media programming is being developed to support and expand prevention messages.

Press kits, posters, and exhibits also are part of Phase I. Existing print materials, from NCI and from other government and voluntary agencies involved in prevention efforts, are being used to disseminate cancer prevention awareness messages. In addition, new materials are being created as needed. Placement of articles and public service advertisements in newspapers and magazines is a continuing activity.

Because health professionals, especially primary care physicians, serve as both gatekeepers and sources of cancer prevention information for the public, they are being informed of the NCI prevention awareness program and are being asked to play a key role in promotion efforts. In addition, the NCI Office of Cancer Communications is examining ways to incorporate cancer prevention education programs into physicians' practices. As Wakefield (1975) stated, "The success of cancer control programs may depend upon how seriously doctors and others in the medical profession take their responsibility to persuade and educate." Health and helping professionals are also expected to play a significant role in Phase II program activities by disseminating cancer prevention information and encouraging healthful behaviors among their patients—especially those who are at greater than average risk for any cancer risk factors.

Other intermediaries include large organizations or corporations that have employee health care and education programs. These worksite programs present numerous opportunities for disseminating cancer information and sponsoring educational programs.

Conclusions

Alcohol and cancer risk messages should be presented with a general message on drinking and smoking or on drinking and nutrition, or they may even be integrated with overall health promotion programs. By including alcohol in discussions of other risk factors for the development of cancer, people may begin to see the combinations of risks to which they are exposed. Promoting wellness as a tangible benefit associated with prevention behavior may also help to avoid the built-in denial reaction that some members of the target audience may exhibit.

It is important to present alcohol-cancer messages to the general public but also to high-risk groups, such as chronic heavy drinkers and young people. When developing material for young people, remember that social factors play a more important role than knowledge in changing behavior. Audio or audiovisual materials for low-literacy groups, who are also apt to be high-risk groups, should also be developed. Alcohol treatment programs should be considered as a forum for dissemination of the alcohol and cancer prevention message. ☐

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Alcohol and Stress

New Directions in Research

Dorothy T. Moore, Ph.D.

Scientific research tends to develop in cycles, following the lead of new discoveries that highlight first one approach and then another, eventually returning to reexplore old pathways for answers to new questions. Thus the current movement in alcohol-related research on stress is toward biology-based explanations for interactions between alcohol use and stress.

Social and psychological factors have not been forgotten (as is demonstrated in Whiten's work on stress, reported under "Research Reports" in this issue), but biology appears to be in the driver's seat. Some old psychological questions now wear biological disguises. For example, where in the brain does alcohol act on nerve cells to relieve anxiety? Such research questions necessarily overlap with ongoing investigations in mental health and other areas (e.g., Marx 1985). The result is a growing mass of new and challenging information on how the mind affects the body and how states of mind express what is going on in the body.

Of all the psychological, social, and biological consequences of consuming alcohol, the one that is probably the most widely appreciated is a feeling of relaxation. Water is a thirst quencher. Not so, alcohol: Alcohol is a stress quencher (while, incidentally, acting on the body as a thirst inducer). So in alcohol we have a substance that seems to relieve a psychological state, stress, while simultaneously inducing a physiological state that also can be called "stress."

Both of these statements are true: Alcohol relieves stress, and alcohol induces stress. Obviously, "stress" has different meanings in these two statements.

A comprehensive study of the relation between alcohol use and stress would require coping with this apparent contradiction in meaning, together with an attempt to explain why alcohol—in moderate doses—seems to allay anxiety, reduce tension, and blunt the piercing sensation of pain. For important practical reasons, however, any project probing the mystery of alcohol-stress interactions must be focused on a particular set of clues. This limitation requires, in turn, a limited definition of "stress" that permits concentration on certain aspects of the problem while leaving it to other scientists to study other aspects. It is no surprise, then, that in this area of alcohol research, definitions of stress are proposed—and debated—in nearly every published report. Those that invoke physiological processes far outnumber, today, those that emphasize social or psychological events.

For decades now, the most popular explanation for alcohol consumption has been the *tension reduction hypothesis* (Brick and Pohorecky 1983), which has been supplemented in recent years by a *social learning* approach (Abrams 1983). Behind these theoretical orientations lies a broad definition of "stress" that includes feelings of tension, anxiety, other emotional pressures, and perhaps even depression. The emphasis is on psychology. But recent developments—advances in laboratory technology and research, new clinical findings—have caused psychological interpretation to yield ground to the biological. The new road runs through physiology and biochemistry, with anatomy providing detailed maps of the territory. Even the concept of "tension reduction" has been given specific biological meanings (as in Brick and Pohorecky 1983).

To many observers—especially psychologists (e.g., Lazarus and Folkman 1984)—this change in the direction of stress research is virtually a retreat. Forty years ago, in efforts to explain how psychological stress affects physical well-being, physiology was "king of the hill." The works of Hans Selye, in particular, mark a period of excessive faith in biological answers, to the exclusion of important environmental and emotional factors.

Today, the theoretical approach is more sophisticated; and alcohol researchers with biological expertise include environmental influences (Melchior and Tabakoff 1981) as well as such cognitive effects as expectations (H. Neville, personal communication, August 30, 1985), which can shape the way a person experiences the effects of alcohol. In addition, it is recognized that stress need not be a reaction to an unpleasant (noxious) event but may in fact be a state induced by strongly pleasant events or simply by a normal, temporary change in the equilibrium of physiological processes, as when we feel hungry or thirsty.

Selye, while aware of such subtle issues, was more influenced by exciting discoveries that pointed to the adrenal glands as producers of hormones secreted in response to stressful events of a noxious nature (Sayers and Travis 1970). Synthesized in and released from the adrenal cortex—the outermost layer of adrenal gland tissue—these adrenocortical hormones were seen by Selye as placing demands of their own on the resources of the body. Proposing that physiological changes that normally occur in response to stress can also cause disease, he gave the

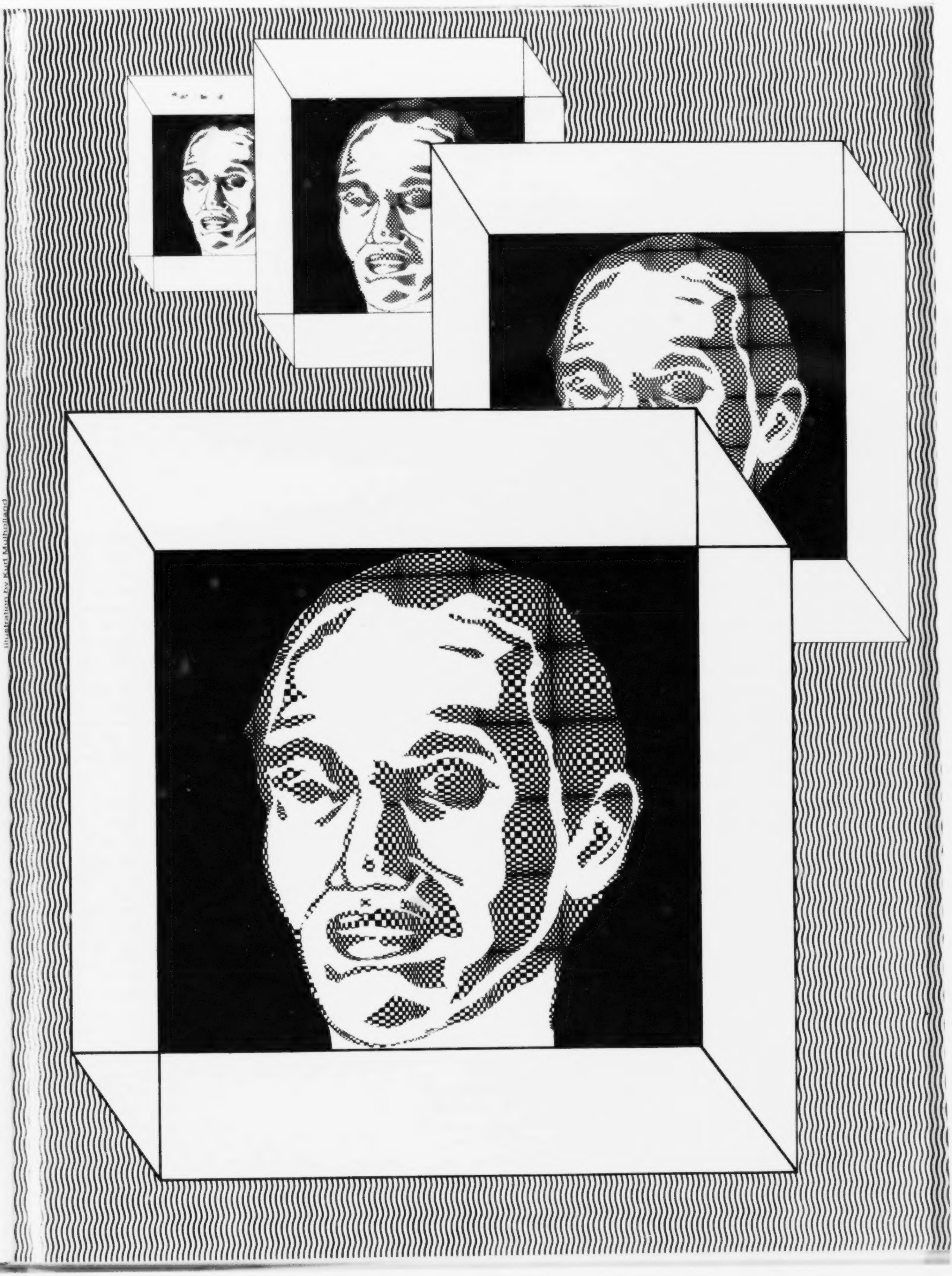

Illustration by Kurt Mulholland

name "general adaptation syndrome" to the sequence of changes (Selye 1946). The negative role Selye assigned to adrenocortical hormones seems exaggerated today, especially considering that in a few years it was found that they were useful for relieving arthritic pain and swelling (Hench et al. 1949, cited in Sayers and Travis 1970).

In the light of current alcohol research, Selye's message is timely, though, because an overproduction of the steroid hormones of the adrenal cortex is a reliable sequel to alcohol abuse; and these substances are associated with clinical problems of varying severity. On the other hand, Brick and Pohorecky (1983) reported well-controlled animal studies in which small, acute doses of alcohol appeared to play a protective role in the animals' physiological responses to different types of stress. Finally, it is apparent from a wide range of human and animal studies that differences of species, sex, age, and other biological factors are somehow linked with differences in physiological responses to alcohol. Altogether, then, hormone responses and other biological processes associated with stress have taken on new importance in alcohol research.

The relevance of these processes to alcohol research in general can be clarified by taking a look at three influential developments. The first of these is the clinical discovery, 10 years ago, of *alcoholic pseudo-Cushing's syndrome*, a disease that involves overproduction of adrenocortical hormones and is associated with alcohol abuse. The second is the long-awaited indentification and isolation, 5 years ago, of a neurohormone, *corticotropin releasing factor*, that stimulates the production of adrenocortical hormones. The third is recent research on the *locus coeruleus*, a group of brain neurons that have widespread connections in the brain and the spinal cord, including areas significantly affected by alcohol ingestion.

Alcoholic Pseudo-Cushing's Syndrome

A reliable complication of chronic alcohol abuse is excess production of cortisol (in pharmaceutical terminology, hydrocortisone), one of the principal steroid hormones secreted by the adrenal cortex. A rise in cortisol levels in the bloodstream is also a reliable symptom in cases of Cushing's syndrome, a family of diseases named after Harvey Cushing (1869-1939), the distinguished American neurosurgeon and endocrinologist.

Characteristic signs of Cushing's syndrome—such as a rounded "moon" face, a hump of tissue high on the back, and marked obesity in the central region of the body—are based on abnormal distribution of body fat. Other possible symptoms range from red-streaked skin blemishes to diabetes and high blood pressure. The patient also feels weak and is frequently depressed.

In 1976, Smals and colleagues (cited in Van Thiel et al. 1983) first reported three Cushing's-like cases associated with alcohol abuse. These patients returned to normal after 3 weeks of alcohol abstinence.

External signs of alcoholic pseudo-Cushing's syndrome are similar to those of the other syndromes, but comparison of this disease with true Cushing's disease has raised challenging questions about the role of alcohol. These questions are reviewed by David Van Thiel, M.D., and his colleagues (1983), whose article includes the table reproduced here (Table 1). Note that hormones other than cortisol are affected; included are those responsible for regulating growth (GH) and for normal thyroid functions (TSH and TRH) as well as hormones (LH and LRF) that regulate endocrine responses in the ovaries and the testes.

Of key theoretical importance is the fact that in cases of true Cushing's disease, adrenocorticotropic hormone (ACTH), which is synthesized and released from the pituitary gland, appears to be responsible for overproduction of adrenocortical hormones; and the level of ACTH itself is elevated in the blood stream. On the other hand, circulating ACTH levels are not elevated in cases of alcoholic pseudo-Cushing's syndrome.

A straightforward expectation in cases of hyperactivity in the hormone-secreting function of the adrenal cortex is that this gland is being overstimulated by ACTH from the body's "master gland," the pituitary. But there are numerous other possible explanations, and for several years Van Thiel (e.g., Van Thiel 1983) has been suggesting that other possibilities should be explored. With specific reference to the role of stress, which presumably triggers ACTH secretion through effects in the central nervous system, he has raised the question of direct effects of alcohol or of its principal metabolite, acetaldehyde, on the adrenal cortex. This is another important variation on a familiar theme in alcohol research: Are the effects of alcohol direct (on the adrenal cortex) or indirect (on regulators of adrenal cortex function)?

With reference to alcoholic pseudo-Cushing's syndrome, Van Thiel and his colleagues (1983) suggest that adrenal cortex activity may be stimulated by alcohol or acetaldehyde without the intervention of ACTH. They speculate that generation of cyclic 3', 5'-adenosine monophosphate (cyclic AMP) may be stimulated here. Because cyclic AMP is involved in normal adrenocortical secretion, this might have the effect of increasing synthesis and release of the hormones in question.

Another possibility, in other types of Cushing's syndrome, is adrenal cancer or an ACTH-producing tumor. These cases cannot be reversed by abstinence from alcohol. Clinicians have long sought a drug that would block the effects of overproduction of adrenocortical hormones without also causing seriously damaging side effects. Successful treatment with such a drug, RU 486, was recently reported by NIH scientists (Nieman et al. 1985).

Corticotropin Releasing Factor (CRF)

An important reminder frequently encountered in alcohol-and-stress research is that the central nervous system ultimately controls the chain of hormone-activating events known as the hypothalamic-pituitary-adrenal axis (HPA axis). The process begins in the brain, with neurohormones secreted by the hypothalamus. These signal the release of ACTH from the anterior lobe of the pituitary gland. ACTH, released into circulation, is carried by the bloodstream to the adrenal glands, where it stimulates secretion of the adrenocortical hormones.

An indispensable key figure in this process is the substance that, passing from the hypothalamus into the pituitary, causes ACTH to be produced. After years of experimental effort, this substance has been isolated and synthesized in the laboratory by Wylie Vale, Ph.D., and his coworkers (Vale et al. 1981) at the Salk Institute for Biological Studies in La Jolla, CA. In addition to pursuing research in basic endocrinology and other areas of biology, Vale and his colleagues work with the scientists, led by Floyd Bloom, M.D., who conduct research in NIAAA's alcohol research center at the Scripps Clinic and Research Foundation in La Jolla.

Discovery of corticotropin releasing factor (CRF) marked the beginning of a new surge of research on hormone systems involved in alcohol effects. Not only has it been possible to utilize CRF and anti-CRF serum for experimental manipulations; it also has been possible, by so-

Table 1. Findings in Cushing's Syndrome and Pseudo-Cushing's Syndrome

Cushing's syndrome and Cushing's disease	Pseudo-Cushing's syndrome	
	Alcoholism	**Depression**
Elevated basal ACTH and cortisol levels	Elevated basal cortisol levels; ACTH normal or reduced	Elevated basal ACTH and cortisol levels
Abnormal diurnal variation	Abnormal diurnal variation	Abnormal diurnal variation
Abnormal dexamethasone suppression	Abnormal dexamethasone suppression	Abnormal diurnal variation
Abnormal ACTH and cortisol responses to stress	Abnormal ACTH and coritsol responses to stress and insulin-induced hypoglycemia	Normal cortisol response to insulin-induced hypoglycemia
Abnormal (reduced) basal and stimulated GH, TSH, FSH, and LH responses to various stimuli	Increased basal GH and abnormal TRH-stimulated GH responses; reduced LH responses to LRF; increased basal TSH but abnormal responses to TRH	Normal basal and stimulated GH levels; normal LH response to LRF; abnormal TSH response to TRH

Source: Van Thiel et al. (1983)

Key: Abnormal dexamethasone suppression *means that dexamethasone, a steroid used to test for normal functioning of the pituitary regulation of adrenal hormones (NIMH 1985), failed to suppress overproduction of adrenocortical hormones.* Abnormal diurnal variation *means that the daily (diurnal) rise and fall of hormone levels was not normal. Abbreviations: ACTH = adrenocorticotropin hormone; FSH = follicle-stimulating hormone; GH = growth hormone; LH = luteinizing hormone; LRF = luteinizing releasing factor (also known as LHRH, luteinizing hormone-releasing hormone); TRH = thyrotropin-releasing hormone; TSH = thyroid-stimulating hormone.*

phisticated laboratory techniques, to determine where CRF occurs in the nervous system.

A principal goal in the research of Catherine Rivier, Ph.D., a colleague of Vale, has been to determine where and how ethanol affects hormone interactions in the HPA axis and also in the hypothalamic-pituitary system that regulates hormone functions of the testes. Her subjects are male rats.

In one series of studies (Rivier et al. 1984), Rivier explored the possibility that the release of CRF, following acute administration of ethanol, would modify the secretion of ACTH. It had always been suspected that alcohol-induced increases in production of adrenocortical hormones results from the release of ACTH, an event initiated by a releasing factor from the hypothalamus. With CRF available for experimental purposes, Rivier was able to show that ethanol-induced release of ACTH was specifically—though not exclusively—dependent on CRF production.

Rivier's results from another experiment in this series also suggested a role for CRF in the development of tolerance: Hypothalamus tissue of rats exposed for 7 days to high levels of alcohol vapors showed slight but significant decreases in CRF content. Thus, CRF, the initial hormonal agent in the HPA chain of events, may itself be suppressed by prior exposure to alcohol. An alternative suggested by Rivier is that CRF may have entered the blood vessels connecting the hypothalamus with the pituitary, thus reducing the quantity remaining in the hypothalamus.

Other research projects of the La Jolla scientists have utilized CRF for a variety of alcohol-related studies. In one instance, John Wenger, Ph.D., (1983) reported that the sedating effect of ethanol administered to rats was antagonized by injections of CRF and that CRF increased the temperature-depressing effect of ethanol. In these studies, the depressing and sedating effects of alcohol are clearly contrasted with the stress-associated effects of ACTH release and adrenal cortex steroid hormones.

In another set of experiments carried out in La Jolla, George Koob, Ph.D., studied the role of CRF in two types of hypothalamic-pituitary stress responses: systemic stress and neurogenic stress (Koob 1983). He identified systemic stress as the type that activates ACTH release by direct hormonal action on the pituitary. Neurogenic stress, he said, activates ACTH release indirectly, by way of neural connections. He speculated that CRF might act within the central nervous system itself, as well as directly on the pituitary gland, to produce stress-related effects. In a variety of behavioral tests with rats, Koob found that CRF injected into brain ventricles tends to induce behavioral signs of stressful arousal. Koob speculated that the arousing effect of CRF may possibly enhance learning—and possibly alcohol tolerance.

As Koob has suggested (Koob 1983), study of the interactions of CRF with circulating hormones, endorphins, and other peptides has the potential for producing intriguing results.

Locus Coeruleus

Having been the object of much research in neuroanatomy, the cluster of brain cells known as the *locus coeruleus* (pronounced LO-kus cee-Roo-lee-us) is a structure well characterized in terms of cell shapes and the pathways traversed by its fibers. Less is known about its functions in the normal scheme of physiology, but it is attracting enough attention today to suggest that it is one of the most productive objects of research.

A brief description should suffice here (for a comprehensive introduction to this subject, the reader is referred to Moore and Bloom 1979): The *locus coeruleus*, like numerous other structures in the brain, is named for its appearance through the microscope lens. This is literally a "bluish place" posterior to the midbrain, part of it bordering the floor of the fourth ventricle, and apparently a key area in the densely branching and interlaced fibers of the reticular formation. Several of its characteristics are considered remarkable by Moore and Bloom: its complex branching dendrites (neuron fibers that receive messages from other nerve cells), its widespread connections with the brain and the spinal cord, and the fact that it contains (in the rat) about 43 percent of all the norepinephrine-producing fibers in the brain.

The fact that *locus coeruleus* (LC) neurons respond to sensory stimulation has been a useful characteristic for research on the effects of alcohol on the central nervous system. Another useful characteristic of these neurons is that, in general, the effect of activating them is to inhibit other nervous system elements. This is a deceptive effect, however, if inhibition is looked at simply as reducing the activity of the whole brain. The result in these systems is the opposite: Inhibition by norepinephrine-containing LC neurons can serve to reduce the inhibition of other neurons, thus enabling more active (now uninhibited) conduction by important centers of the brain. LC effects on the cerebral cortex, for example, may be to reduce the inhibition exerted by other neurons, thus releasing cortical cells that then exhibit "arousal."

An example of alcohol-related research on this inhibition-inhibiting "arousal" system of neural fibers is a study carried out by three scientists in La Jolla, Gary Aston-Jones, Ph.D., Stephen Foote, Ph.D., and Floyd Bloom, M.D. (Aston-Jones et al. 1982). The sensory stimulation used in this study using rats was also a classic stress stimulus, footshock delivered by electric current.

Electrophysiological recordings were made of the responses of single LC cells. Compared with the activity of cells not affected by ethanol, those recorded under post-ethanol conditions showed two changes of significance: (1) the cells' re-

Stress, Alcohol, and Cigarette Smoking

Judith E. Funkhouser

The combination of alcohol and nicotine is often used as a form of self-medication to "protect" against a variety of stressors or stressful situations. But such "polydrug use" is a false remedy, and, in fact, increases the risk of cancer and other serious diseases.

Although fewer people are now smoking overall, it is still not uncommon to see a person attempt to cope with as mildly stressing a situation as an evening business function by smoking and drinking. Even for those who have quit smoking, new social or professional situations, or settings at which drinks are served, can trigger smoking and drinking urges.

Of course, both drugs are also used—and abused—as a means of coping with more severe stress such as that associated with unemployment, divorce, or other forms of loss.

Nevertheless, for those who smoke and who also consume alcohol, chances of developing oral cancers are up to 15 times greater than for those who don't smoke and don't drink.

Caffeine, another drug that is often used in conjunction with nicotine, belongs to the class of compounds found in studies on bacteria to cause mutations. Some epidemiological studies have even suggested a link between excessive coffee drinking and cancer of the urinary bladder and pancreas in subjects who also smoked.

The problem is not just with cigarettes. Pipe and cigar smoking, tobacco chewing, and snuff dipping—all increase one's risk of developing certain types of cancer. Pipe and cigar smokers may be at less risk than cigarette smokers for lung cancer, but they are at equal risk of developing cancers of the mouth, larynx, and esophagus. Snuff dipping, a practice that is on the increase among teenagers, has been associated with increased incidence of cancers of the mouth and throat.

In addition, alcohol and nicotine consumption by pregnant women has been associated with low-birth-weight infants and birth defects. It appears that while each alone can cause birth defects, the combination of alcohol consumption and smoking increases the likelihood of serious deformations and irreversible mental retardation in the offspring.

As a nonsmoker, you can help to promote healthy lifestyles in relation to smoking and alcohol use. You can encourage smokers to quit by urging them to practice the 4Ds—delay, deep breathing, drinking water, and doing something else. You can also help by urging them to seek help from a variety of programs that offer support to persons who are courageous enough to kick the tobacco habit. By supporting a person's efforts to stop smoking, you also may be promoting a healthful attitude that will positively influence the person to decrease his or her alcohol use. Conversely, encouraging someone with an alcohol problem to seek treatment may ultimately influence his or her smoking behavior. In fact, the number of nonsmoking support groups for alcoholics is growing and offering support for better stress management.

We also know that children and teenagers who begin smoking cigarettes are more likely to drink alcoholic beverages than those who do not start smoking. As a parent, if you want to prevent alcohol or other drug use, you can begin by ensuring that your child does not start smoking or drinking. You can also help by not allowing your child to purchase cigarettes.

Also, refrain from allowing your children to serve alcoholic beverages at your parties or celebrations. Studies have shown that this engages children in "drug-taking" behavior even if not directly. You can also serve as a role model for resisting peer pressure and saying no to unwanted drugs. The next time you go to a cocktail party, for instance, you might want to pause to consider whether you really want an alcoholic beverage or if you would rather have something nonalcoholic to quench your thirst.

Demonstrating your ability to make a mature decision about your consumption of alcohol and tobacco has been shown to be a powerful influence on children's behavior. You can also help your children by being clear that you expect them *not* to smoke, drink or use other drugs.

If you work in the alcohol or other drug abuse fields, it is extremely important to understand the risks of using nicotine, caffeine, and alcohol and to promote prevention awareness messages in your contacts with patients and clients. If you would like information on prevention activities, the effects of tobacco and alcohol, or on current research, write to:

National Clearinghouse for Alcohol Information
P.O. Box 2345
Rockville, MD 20852

National Clearinghouse for Drug Abuse Information
P.O. Box 416
Kensington, MD 20795

Office on Smoking and Health
U.S. Department of Health and Human Services
Parklawn Building, Room 110
5600 Fishers Lane
Rockville, MD 20857

Office of Cancer Communications
National Cancer Institute
National Institutes of Health
Bethesda, MD 20205

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sponses to footshock were reduced and (2) the normally regular timing of LC cell responses was disrupted. These changes occurred despite no significant change in the spontaneous discharge rate of cells affected by ethanol.

The authors suggest that changes in the discharge patterns of LC cells, which project diffusely throughout the central nervous system, could mean that ethanol has markedly disruptive effects on adaptive behavior. One reason for this conclusion is the presumed role of the LC in alerting the brain to novel sensory events and other new situational factors, a role well suited to a brain system that dampens inhibitory effects of other systems.

One of the authors of this study, Stephen Foote, has collaborated with Rita Valentino, Ph.D., who is now at George Washington University, in a review of LC and CRF interactions and stress (Valentino and Foote in press). They begin with a definition of "stressful" as depending on evidence that ACTH is released from the pituitary gland. The rate at which new discoveries can be anticipated in the area of stress research is suggested by two important points made in the introduction of their chapter: (1) CRF may be a neurotransmitter as well as a neurohormone and (2) CRF cell bodies and fibers have been discovered in brain regions other than the hypothalamus. One of these extrahypothalamic regions is the *locus coeruleus* (De Souza 1985).

It is evident from the Valentino and Foote review that CRF, having acquired a new role as a neurotransmitter, could prove to have a doubly responsibile role in stress. According to these authors, CRF appears to affect autonomic nervous system responses associated with stress. This implies, in turn, that CRF may—indirectly, perhaps—activate stress-related secretions from the medulla of the adrenal glands as well as from the adrenal cortex. The adrenal medulla pours epinephrine (also called adrenaline) into the bloodstream in response to stimulation by the sympathetic division of the autonomic nervous system. This is a distinctly nerve-dominated mode of stress response, the route by which signals from the brain trigger the "fight or flight" pattern of sympathetic nervous system responses to stress-provoking stimuli.

A final word about the physiological processes studied in stress-related research, whether they be hormonal or neural: The responses apparently differ according to differences in the type of stressor. No single system is going to be set in motion by *all* kinds of stress. In our attempts to distinguish the functions of one system from another in any given instance, we should gain a more enlightened understanding of the precise meaning of this controversial term, "stress." □

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What Do We Know About Medical Students' Use and Abuse of Alcohol and Other Drugs?

A Constructive Critique

Thomasina Borkman, Ph.D.
Nathan Rosenberg, Ph.D.

In assessing the education of medical students for responsible roles in preventing and treating alcohol and other drug dependency, a key factor is the status of the students themselves as consumers of alcohol and other drugs. Are medical students a high-risk population in this respect? Or do they, in general, exemplify the healthful lifestyle they will advise for their patients? And what do they know, personally, about prevention of alcohol- and drug-related problems?

It would seem that the best way to answer these and other appropriate questions would be to do a survey of medical students' practices and attitudes related to the use of alcohol and other drugs. This article presents an overview of several such surveys carried out in U.S. medical schools during two time periods. The results suggest that, although between 6 and 17 percent of the surveyed students admitted to having problems with alcohol, this is only a tentative estimate. As will be discussed under "Conclusions," more definitive information awaits the design and implementation of new and improved research on this subject. Only then can we know to what extent medical students themselves need help before they can carry out their responsibilities as future physicians.

Early Surveys of Drug Use: 1964-1972

Table 1 summarizes the surveys of drug use among U.S. medical students from 1964 through the early 1970s. These studies were stimulated by concern about college students and other young people experimenting with psychoactive drugs in the mid-1960s.

The eight studies cited here were typically simple questionnaire surveys, usually of medical students in one medical school. Comparison groups of students in other professional schools were not usually included. Some studies asked the students only about their use of marijuana (Grotheer 1973; Solursh et al. 1971). The survey instruments did not consistently ask students to report on use of the full range of drugs listed in Table 1 (i.e., marijuana, amphetamines, hallucinogens, sedatives, cocaine, and opiates). Alcohol was seldom mentioned, nor were attempts made to quantify its use. (Blank cells in Table 1 in the "percent ever used" columns mean that the students were not asked about these drugs.) Data analysis in these surveys was limited to descriptive statistics: reports on the percentage of students using a specific drug.

Findings from the surveys in the 1960s indicate that marijuana and amphetamines had been used by more students than the other drug categories. In a 1966–1967 survey of the Albert Einstein Medical School in New York, Blaine and coworkers (1968) found that 24 percent of the students reported using marijuana, 20 percent amphetamines, and 3 percent LSD. Alcohol and cocaine were not listed among the drugs in these surveys.

A comparison of survey data of the 1960s with those of the 1970s reveals that the percentage of students who reported ever using marijuana had increased, paralleling the increases in the college-age population in general. By the early 1970s, from 46 percent to 70 percent of medical students reported having used marijuana (see Table 1). Prevalence rates varied by geographical location of the medical schools, however, with the Midwestern and Southern medical students reporting lower rates than East Coast or West Coast students. These geographical differences, similar to those found among college students in general, were considered evidence that medical students are similar to their college peers in drug use practices (Lipp et al. 1972; McAuliffe et al. 1984; Thomas et al. 1977).

Later Surveys of Drug Use: 1977–1982

Table 2 presents the sampling characteristics and findings of surveys of U.S. medical students' drug use for the period 1977–1982, as summarized by McAuliffe and colleagues (1984). The five New England surveys included premedical students, medical students, and residents. For comparison, data from other professional school students and college undergraduates are included as well.

The more recent surveys show significant methodological improvements over the surveys of the 1960s and early 1970s. One such improvement is the inclusion of comparison groups. In addition, several standardized measures of drug use are clearly defined and operationalized: "ever used" in lifetime, "current users" within the last year, and "current regular use"—once per month or more. And students were asked to report the full range of drugs they used, including cocaine.

Reported reasons for taking each drug were of interest to the researchers because physicians can treat themselves by self-prescribing drugs. McAuliffe and colleagues believe drug addiction among physicians has in times past resulted primarily from medical self-treatment with psychoactive drugs; but there may also be

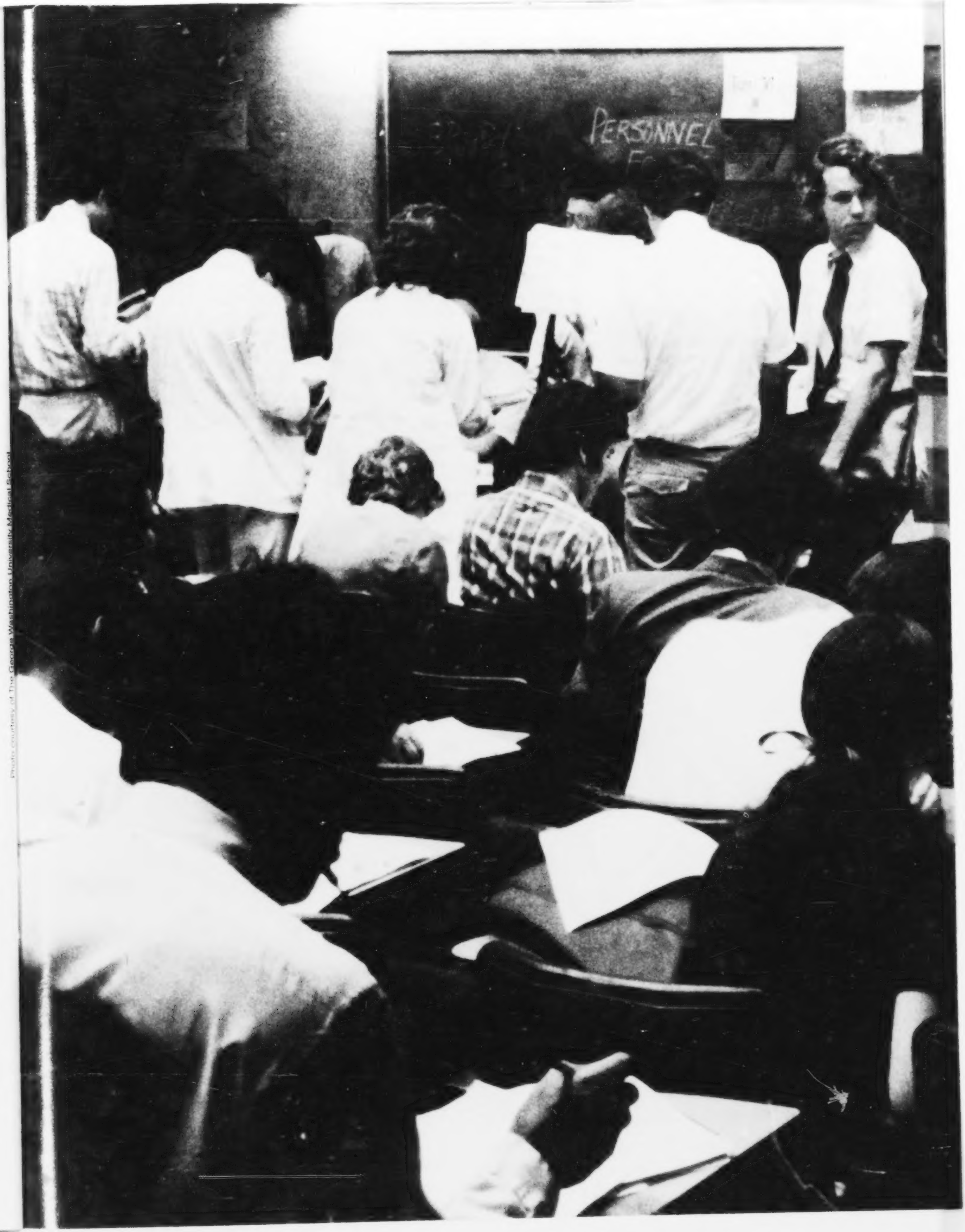

Photo courtesy of The George Washington University Medical School an additional new problem among medical students of recreational psychoactive drug use that mirrors a trend in the general college-age population. They cite research suggesting that many college students and some older middle-class drug users "have progressed from marijuana use to experimentation with higher risk drugs, such as sedatives, e.g., methaqualone; cocaine; and even opiates, especially Percodan and heroin" (McAuliffe et al. 1984, p. 35). Their surveys were designed to determine whether premedical students, medical students, and residents also are beginning to experiment with these drugs. Therefore, defining nonmedical or recreational drug use became important in order to separate it from medical use.

Apparent trends can be summarized: First, the percent "ever using" marijuana among the premedical college students, medical students, and physicians-in-training seems to have increased; the mean percentage in Table 1 for marijuana use is 48.1 percent whereas in Table 2 it is 70 percent for medical students in New England. Also, the Harvard premedical students did not appear to differ in usage from the nonpremedical students or even from undergraduates in general (56, 59, and 56 percent, respectively). However, these two tables are not truly comparable geographically or in other demographic respects.

The next questions concern a possible increase in the use of high-risk drugs, and whether or not the young and future physicians were similar in this regard to their age peers. From 7 percent to 10 percent of medical students and young physicians (but not premedical students) had tried sedatives, which was a higher percentage

Table 1. Studies of Nonmedical Drug Use by Medical Students

				Percent Ever Used					
Authors	**Year of Data Collection**	**Sample Size**	**Population**	**Marijuana**	**Amphetamines**	**Hallucinogens**	**Sedatives**	**Cocaine**	**Opiates**
American Medical Students:									
Smith and Blackly (1966)	1964	208	U. of Oregon Medical School		39[a]				
Blaine et al. (1968)	1966–67	255	Albert Einstein School of Medicine. Classes of 1967–71	24	20[b]	3	0.4		0
Watkins (1970)	1969	233	LSU School of Medicine		54				
Polakoff and Lowinger (1972)	1969	325	150 students at convention plus 175 freshmen and sophomores at midwestern medical school	43	14	5		(2)[c]	(2)[c]
Lipp et al. (1972)	1970		Medical students from:						
		213	San Francisco Bay Area	70					
		367	New York City	68					
		251	New York State	46					
		226	Nebraska	16					
Slaby et al. (1972)	1970	221	Yale Medical School	68	7	10			
		188	Yale Law School	73	8	7			
Mechanick et al. (1973)			University of Pennsylvania Medical School						
	1970	449		54					
	1972	463		70		10			
Grotheer (1973)	1972	393	Midwestern medical school	49					

[a] *Forty-four percent used amphetamines, but ten gave possible medical reasons (dieting, stuttering and narcolepsy) for first use.*
[b] *Some of this use was probably medical, but the proportion is unstated. The class of 1970 was used once in this calculation, although it was surveyed twice.*
[c] *Two percent used either cocaine, opium, or heroin.*

Source: Adapted from McAuliffe et al. 1984 than in the surveys of the early 1970s (0.4 percent). Similarly, an increase in experimenting with opiates was also found among the medical students (7 percent) and physicians-in-training (5 to 27 percent), but not the premedical students. Cocaine showed the highest frequency of nonmedical use: premedical students (17 percent), medical students (21 percent), and young physicians (21 percent). Cocaine use increased in comparison with the use reported in the early 1970s, but this drug was included in only one of the earlier studies. McAuliffe and coworkers concluded that "changes over time in drug use by young medical professionals appear to be consistent with general social trends" (1984, p. 43).

The surveys that used comparison groups revealed that alcohol and drug use by medical students closely followed the general trends of their regional school peers. There was no indication that alcohol and drug use patterns among medical students are influenced by exposure to biomedical knowledge about these substances. However, one should not generalize from these studies to all medical students nationwide, because regionality has been shown to be associated with different usage patterns for medical students and other college and professional school populations.

Little information is available on social or demographic factors in drug or alcohol usage among medical students because most studies have not conducted such important analyses. For example, now that females are a significantly increasing proportion of medical students, and their alcohol use patterns are known to be different from those of males, future surveys should examine use patterns by sex.

A final indicator of drug abuse was obtained by asking the young physicians directly "Have you ever had a problem of drug dependence?" Two percent answered yes to the question. McAuliffe and colleagues (1984) separated the high-risk group from the general trend:

> Young medical professionals and medical professionals-to-be have clearly participated in the broader trends of middle-class recreational drug use, but medical professionals are followers, not leaders. . . . Also, most of the physicians, medical students, and nursing student users were not regular users or deeply involved in using a wide range of drugs. However, . . . there were a few outliers, persons who have already experienced problems with drugs or whose more extensive use could place them at a substantially higher risk than the others. (p. 49).

Alcohol Studies

Table 3, following the format that was used by McAuliffe and colleagues (1984), summarizes the results of eight studies. (Some of these studies on alcohol use also are found in Table 1 on the nonmedical drug use of medical students.) Three of the studies, with a primary focus on attitudes, contain only incidental data on alcohol use among medical students (Chappel et al. 1977; Coe et al. 1982; Gravenstein et al. 1983).

Table 2. Nonmedical Drug Use by Premedical, Medical, and Nursing Students, Physicians, and Comparison Groups

			% Ever Used Drugs						
Year of Data Collection	**Sample Size**	**Population**	**Marijuana**	**Amphetamines**	**Tranquilizers**	**Hallucinogens**	**Sedatives**	**Cocaine**	**Heroin and Other Opiates**
Surveys of Harvard College Students:									
1979	152	Premedical	56	(24)[a]	(24)[a]	(24)[a]		17	0
	211	Non-premedical	59	(28)[a]	(28)[a]	(28)[a]		18	0
1981	257	Undergraduates	56	14	6	9	10	20	2
Survey of New England College Students:									
1977	3185	Males	82	22(14)[b]	13	21	9(12)[c]	19	6
	3898	Females	65	23(12)	18	13	11(10)	12	3
Survey of New England Professional School Students:									
1979	358–360	Nursing	62	14	13	9	5	15	2
	432–439	Business	61	14	14	13	9	14	2
	360–364	Medicine	70	15	13	17	10	21	7
	152–155	Communications	65	21	26	19	16	23	4
	368–374	Law	71	21	15	22	11	29	5
	231–234	Social Work	78	23	33	23	17	29	6
	133	Counseling	79	26	27	30	11	29	7
Survey of Young Physicians Training in Boston Area:									
1981–82	135	U.S. MD's:							
		Recreational	67	13[d]	6	16	7	21	5
		Self-treatment	1	4	17	0	8	1	27
	57	Foreign MD's:							
		Recreational	31	14	12	0	7	3	7
		Self-treatment	2	0	22	0	5	0	26

[a] *Used either an amphetamine, tranquilizer, or hallucinogen.*
[b] *The percentage outside of parentheses refers to amphetamine use "to help stay awake, etc."; the percentage within the parentheses refers to amphetamine use "just to get high."*
[c] *The percentage outside of parentheses refers to sedative use as "sleeping pills"; the percentage within the parentheses refers to sedative use "just for the effect."*
[d] *Some of the amphetamine use was actually instrumental according to subjects' comments, even though subjects were asked to report only recreational use.*

Source: Adapted from McAuliffe et al. 1984.

Table 3. Studies Of Alcohol Use By Medical Students In The United States

Authors	Year of Data Collection	Sample Size	Population	Alcohol Measure(s) Used and Percents[1]					
Blaine et al. 1968	1966–1967			(1)		(2)		(3)	
			Albert Einstein School of Medicine	% any use[2]		% use as stimulant		% use for mood elevation	
		96	first year–1966	89		9		8	
		87	second year–1967	72		8		3	
		100	first year–1967	86		7		6	
Lipp et al. 1972*	1970			(1)		(2)			
			Four medical schools:	% current use		Mean # of drinks/month			
		A 213	1-west coast	93		15.7			
		B 226	2-east coast	90		17.2			
		C 367	1-midwest	89		8.9			
		D 251	School names not given	91		11.8			
Thomas et al. 1977	Not Reported			(1)		(2)		(3)	
				% ever used		freq. alcohol intake		freq. of drunkenness after alcohol intake	
						Daily	Once week +	Never	50% or more
		172(T)	Midwestern medical school	100					
		DK	Freshmen			9.3	4.0	4	17.3
		DK	Soph/Juniors			0	27.5	0	10
		DK	Seniors			5.3	24.6	3.5	0
Rochford et al. 1977	Not Reported			(1)		(2)			
			Freshman medical students; school not reported	% ever used		Current use of ethanol oz/week[3]			
						0-.09	.1-3.0	.1-3.1 +	
		134		94		34.1%	3%	6.7%	
Chappel et al. 1977	Not Reported			(1)		(2)			
			Univ. of Nevada School of Medical Sciences	freq. use of alcohol		Self-reported problems with alcohol			
				Not at all	2-4 times/Week				
		46		11	39	6.5			
Coe et al. 1982	Not Reported					(1) frequency of alcohol use per week			
			Midwestern private unit.	not at all		once/week or less		2+ times	
		217	Freshman law	7		43		50	
		152	Freshman medical	14		42		44	
Gravenstein et al. 1983	1980					(1) frequency of alcohol use per week			
			Southeastern University:	not at all		less than weekly	once week or more	daily	
		92	3rd year medical students	3		33	56	7	
Clark 1983	Not Reported		midwestern college freshman	(1)		(2)			
				alcohol abuse in lifetime[4]		alcohol abuse last six months[4]			
		115	medical students	30		12			

This study is also found on Table 1—Studies of Nonmedical Drug Use

[1] *Each different measure of alcohol use is numbered (1), (2), etc.*

[2] *No definition of measure of alcohol use given by authors*

[3] *Percents calculated by author from Data in Table 2*

[4] *Based on questionnaire to diagnose past or current episodes of drug or alcohol abuse from NIMH Diagnostic Interview Schedule.*

A variety of measurements was used by different investigators. This precludes systematic comparison of findings among the studies. Many measures were ambiguously defined and are of little value. For example, Blaine and coworkers (1968) report that the majority (72 to 89 percent) of three classes of medical students claimed "any use of alcohol;" but this ambiguity leaves the reader wondering whether this meant over a lifetime, during the past school year, or some other interval.

Attention was usually given in these studies to administering the questionnaires anonymously and unobserved by university authorities. Such a procedure increases the likelihood of honest self-reporting by respondents.

High rates of 94 percent (Rochford et al. 1977) and 100 percent (Thomas et al. 1977) of students in two medical schools were found to have "ever used alcohol." These isolated findings cannot be taken as valid for other medical student populations, however.

Frequency of current use was the most common alcohol measurement sought in the surveys. Unfortunately, the investigators defined the number and content of the categories differently, which restricts the comparisons that can be made. Coe and coworkers (1982) compared first-year medical students with first-year law students from one Midwestern private university. No significant differences were found between them in the frequency of alcohol use. However, 14 percent of medical students (versus 7 percent of law students) reported no alcohol drinking at all. At the other end of the continuum, 44 percent of medical students and 50 percent of law students reported drinking two or more times per week.

Similar findings of a minority of medical students who did not currently drink at all were reported for six other classes of students: 11 percent of medical students at the University of Nevada (Chappel et al. 1977); 3 percent of students from a Southwestern medical school (Gravenstein et al. 1983); and 7 to 11 percent in surveys from four medical schools (Lipp et al. 1972). At the other extreme, daily drinking was found among 7 percent of the Southeastern university students (Gravenstein et al. 1983) and 0 to 9.3 percent of four classes in one Midwestern school (Thomas et al. 1977).

Alcohol Abuse

Few studies of medical students in the U.S. attempted to measure alcohol abuse. Of the three studies with some measure of alcohol abuse, two used inadequate measures of self-reports of unspecified problems with alcohol or the frequency of becoming drunk after ingesting alcohol. For example, the authors of one study concluded that "each year approximately 10 percent of the class became identifiable as potential 'problem drinkers.'" (Thomas et al. 1977, p. 42). Unfortunately, their definition of and criteria for classifying problem drinkers were not spelled out.

Clark (1983) adapted a standardized measurement of alcohol abuse for his study, but the investigator did not specify what form his adaptation took. A questionnaire from the NIMH Diagnostic Interview Schedule was used to diagnose past or current episodes of alcohol or drug abuse. Among the 115 freshmen medical students surveyed from one private Midwestern university, Clark found that 12 percent reported alcohol abuse in the prior 6 months and 30 percent reported alcohol abuse during their lifetime. Among the 35 students who met the criteria for alcohol abuse at some time, the most common impairment items were blackouts (69 percent); a period of excessive drinking (63 percent); objections of family or friends to excessive drinking by the respondent (51 percent); consumption of as much as three six-packs of beer, three bottles of wine, or a fifth of liquor in a day (49 percent); and physical fights while drinking (34 percent). Only 52 percent (60) of the 115 students reported no symptoms or impairments resulting from heavy drinking in their lifetime.

In summary, these few studies indicate that some medical students (6.5 to 17 percent) will report on anonymous questionnaires that they have problems with abusing alcohol. However, one should not generalize from these studies of a few unrepresentative medical schools based on such small samples and inadequate measurements of alcohol abuse. Instead, these studies reveal the paucity of adequate data on the prevalence of alcohol and drug abuse among medical students in the United States.

Conclusions

1. Adequate conceptualization and measurement of alcohol and drug abuse for epidemiological surveys of medical students needs to be determined and developed. In particular, little reliable data exist on the prevalence of alcohol abuse among medical students and residents. There is an urgent need to define and measure alcohol abuse in these populations.

2. Surveys of alcohol and drug abuse should include sociodemographic analyses, especially by sex, region, class in school, and religion.

3. Family history studies of alcohol and drug abuse may be one means of identifying students with problems. ☐

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State and National Trends in Alcohol-Related Mortality: 1975–1982

James D. Colliver, Ph.D.
Henry Malin, M.A.

Analysis of State and national trends in alcohol-related mortality in the United States over an 8-year period, 1975 through 1982, reveals significant decreases in the chronic liver disease and suicide death rates. Trends in the data on deaths from motor vehicle accidents, alcoholism, and homicide were mixed but showed encouraging declines toward the end of the period.

Information on trends in the incidence of problem drinking and alcoholism is essential to skillful program planning, efficient resource allocation, and appropriate targeting of populations in need of services. Although much of the information that is needed to meet these requirements is derived from general population surveys, data on deaths from alcohol-related causes provide information essential for making estimates for specific demographic groups and geographic areas. Mortality data cannot tell us the number of living alcoholics, but the human impact of deaths related to alcohol consumption gives mortality reports high visibility in policymaking.

While all deaths attributed to alcoholism, alcohol psychosis, and alcohol poisoning are, by definition, alcohol-related, these are relatively rare and provide only a limited picture of the consequences of long-term heavy drinking. Chronic liver disease, motor vehicle accidents, suicide, and homicide account for a larger proportion of the approximately 1.9 million deaths in the United States each year. However, incomplete reporting and lack of appropriate diagnostic categories make it impossible to measure the exact role of alcohol in deaths from these causes.

In the research literature, estimates of the contribution of alcohol to fatalities vary widely. Cirrhosis of the liver, one of the leading causes of death, is estimated to involve alcohol in 41 to 95 percent of the cases (Day 1977). Fatal motor vehicle accidents, leading the list of killers of American youth, are reported to involve drinking drivers 42 to 53 percent of the time (Roizen 1981). In suicide cases, studies show that the victim either was drinking or had a history of alcohol abuse 20 to 37 percent of the time; and among homicides, either the victim or the perpetrator was drinking or was recognized as having had a drinking problem in 49 to 70 percent of the cases (Roizen 1981). While not considered in this analysis, deaths from several other causes reveal important effects of alcohol abuse; these include fires, falls, and certain types of cancer.

A recurring problem in studying trends in mortality is that the system for classifying the cause of death is updated periodically to reflect changes in medical knowledge. Between 1978 and 1979, the National Center for Health Statistics (NCHS)—the primary Federal source of information on mortality—changed from the eighth to the ninth edition of the International Classification of Diseases as a system for reporting diagnostic information from death certificates. In order to study mortality trends across this change, it is necessary to convert diagnostic information from the two editions into a common base. The conversion system used for this study was developed by the authors (Colliver et al. 1985).

Another consideration in studying trends in mortality rates is that the age distribution of the population changes over time and varies from place to place. Even without a change in mortality in specific age groups, higher death rates are expected to occur as the proportion of older persons in the population increases.

In order to compensate for State-to-State variations in the age mix of the population and to offset the widely discussed trends in concentrations of individuals in different age groups, mortality rates were adjusted to a uniform population base. Using this method, age-adjusted mortality rates were computed for each of the causes of death listed above for each State and for the total United States. The rates were then analyzed to identify significant straight-line trends, whether increasing or decreasing.

Figure 1 shows the overall trends in mortality from the five most prevalent causes studied in this analysis. In this figure, the age-adjusted mortality rates have been standardized to a base of 100 percent in 1975 to permit comparisons to be made. Notable patterns shown in this figure include a decline in the cirrhosis death rate and a small, but significant, decrease in the suicide rate. State-level data on trends that were nationally significant are presented in Tables 1 and 2. Deaths caused by alcoholism, motor vehicle accidents and homicide showed mixed trends but declined in the last years of the period of analysis.

Cirrhosis

The most prominent trend shown in Figure 1 is the decrease in the cirrhosis mortality rate, which went from 13.7 to 10.6 deaths per 100,000 population (age-adjusted) between 1975 and 1982. Statistically significant declines in the cirrhosis death rate were observed in 33 States, as shown in Table 1.

The reason for these trends is uncertain, particularly since the onset of cirrhosis is slow and the course of the disease may be influenced by several factors in addition to heavy drinking. It has been suggested that one reason for the decrease in cirrhosis mortality is an improvement in medical care that has made it possible for persons who have liver cirrhosis to live longer (AEDS 1985*b*). If this is true, the decline in the cirrhosis death rate may not reflect a change in drinking habits in the general population. For this period reported, neither national data on per capital consumption nor data on drinking patterns (e.g., the proportion of the population who are the heavier drinkers) has shown any sharp change, and survey data for the decade preceding the analytic period does not show decreases.

The District of Columbia ranked highest in deaths from chronic liver disease during the entire 8-year period of this study, although the rate declined significantly. Nevada was second-ranked in most years, but ranked fifth in 1982. In that year the places with the highest cirrhosis mortality rates were the District of Columbia, Alaska, California, and New York.

Some possible explanations of these rankings include differences in apparent alcohol consumption and demographic differences. Consumption data show that the District of Columbia, Nevada, and Alaska were among the top six States in purchases of alcoholic beverages from 1975 through 1982 (AEDS 1985*c*). Also, Alaska and the District of Columbia have higher per capita rates of clients in alcoholism treatment than other areas based on the 1982 National Drug and Alcohol Treatment Utilization Survey (NDATUS). The District of Columbia is unique in this analysis in being exclusively urban and in having a population that is predominantly black. Black males have the highest cirrhosis rates of any race/sex group (AEDS 1985*b*). Nevada, Alaska, and the District of Columbia also have relatively high proportions of divorced males, a population with frequent alcohol problems (AEDS 1985*a*). (Turn to page 66 for a discussion of possible explanations for the general downward trend in cirrhosis mortality rates.)

Suicide

From 1975 through 1982 the nation experienced a slight, but significant, decrease in the rate of suicide deaths. This overall trend was paralleled in 17 States, which are highlighted in Table 2. The literature on suicide indicates that rates for older males have declined over the past 30 years while those for persons 15 to 24 years of age have increased (Weed 1985; Williams 1985).

Regardless of year, Nevada had the highest suicide death rate. Other States ranking high in suicides were New Mexico, Wyoming, Arizona, Colorado, and Montana. Some of these States also rank high on variables reflecting social change, such as divorce rates and rates of population growth (AEDS 1985*a*). In addition, they have relatively high proportions of American Indians, a group with high rates of alcohol problems and of suicide, especially among the young.

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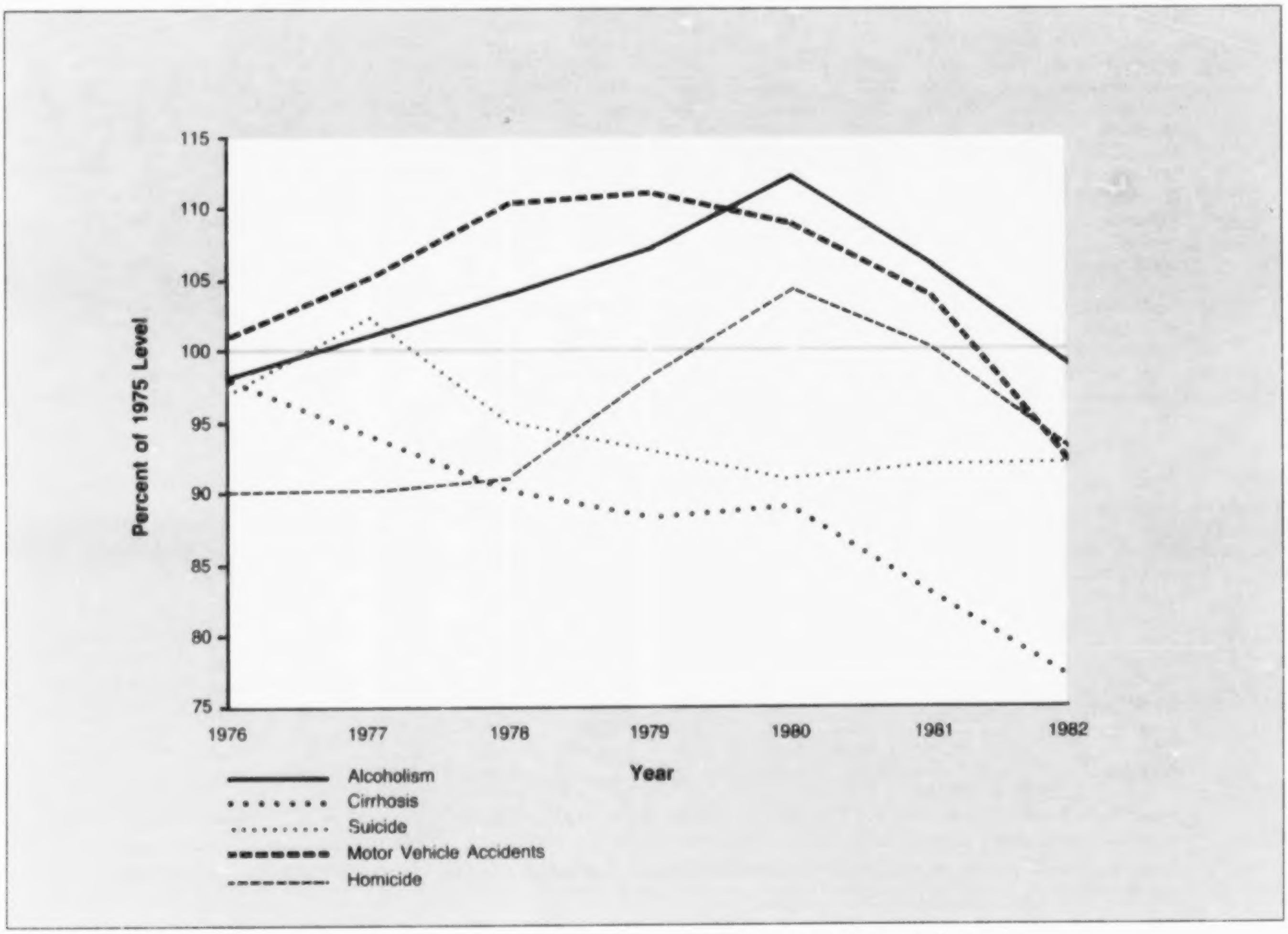

Figure 1. Trends in Age-Adjusted Mortality Rates for Five Causes Standardized to 1975 Rates
(Source: Alcohol Epidemiologic Data System)

Table 1. Age-Adjusted Death Rates for Alcohol-Related Causes by States, 1975–1982: Chronic Liver Disease and Cirrhosis

State	Age-adjusted death rate[1] 1975	1976	1977	1978	1979	1980	1981	1982	Regression analysis results or slope[2]
Alabama	8.47	8.81	9.03	8.62	8.82	8.51	8.80	8.35	
Alaska	19.94	18.54	15.63	12.99	15.12	12.49	13.70	16.59	
Arizona	15.02	14.94	14.52	14.86	13.56	13.41	12.17	11.90	−.48
Arkansas	7.74	7.31	6.23	6.51	7.46	6.99	8.10	7.09	
California	19.63	18.46	18.28	17.54	17.00	17.46	16.15	15.47	−.52
Colorado	12.51	11.51	11.01	10.29	10.34	10.31	9.28	9.72	−.39
Connecticut	12.67	12.26	12.40	12.78	11.78	10.36	11.04	9.22	−.44
Delaware	17.51	14.89	16.88	14.36	13.38	13.88	9.53	9.52	−1.10
District of Columbia	56.91	50.96	46.74	42.94	36.57	35.91	36.47	30.25	−3.55
Florida	15.05	15.88	15.34	13.76	13.92	13.85	12.87	12.24	−.46
Georgia	11.83	12.14	11.03	11.25	10.99	11.88	10.41	10.35	−.20
Hawaii	7.51	8.86	8.15	6.50	7.96	8.48	6.75	5.76	
Idaho	8.62	9.66	10.27	8.25	7.14	7.78	6.34	9.09	
Illinois	13.88	14.17	14.58	13.39	13.06	12.83	12.42	11.12	−.40
Indiana	9.52	9.15	9.47	8.91	9.09	9.42	8.48	7.41	−.21
Iowa	8.31	7.29	7.45	6.89	6.53	6.52	6.18	6.22	−.28
Kansas	7.54	7.57	8.29	6.58	7.31	7.62	7.43	6.68	
Kentucky	10.40	9.34	9.01	9.48	9.43	8.44	9.34	8.18	−.21
Louisiana	10.72	10.74	10.25	10.06	9.61	11.22	10.26	8.43	
Maine	13.83	12.47	12.17	13.18	11.88	10.92	11.07	11.53	−.33
Maryland	14.25	14.13	12.66	12.11	11.25	10.71	9.38	8.58	−.83
Massachusetts	15.37	14.52	13.82	13.68	11.85	11.82	10.70	10.55	−.72
Michigan	17.27	16.01	14.59	14.22	14.33	14.15	12.78	12.57	−.60
Minnesota	8.81	9.05	8.63	7.97	7.24	7.41	8.07	7.02	−.26
Mississippi	5.83	9.14	7.39	7.65	7.70	7.67	8.26	6.62	
Missouri	9.39	8.95	9.76	9.02	8.41	8.49	7.85	7.83	−.25
Montana	10.27	14.29	11.93	12.83	8.07	12.32	13.18	10.56	
Nebraska	9.98	8.31	10.57	8.38	7.33	7.24	6.78	6.98	−.47
Nevada	20.82	23.75	21.74	16.59	22.34	21.37	17.46	14.67	
New Hampshire	10.95	13.97	14.48	13.40	11.73	11.57	9.57	8.67	−.58
New Jersey	14.15	14.60	13.79	13.71	12.10	13.03	12.47	11.52	−.39
New Mexico	18.76	17.68	15.17	16.16	14.81	13.94	13.95	13.40	−.73
New York	19.49	19.20	18.03	17.62	17.60	17.91	16.53	15.33	−.51
North Carolina	13.66	12.02	12.81	11.27	12.04	11.48	10.33	9.44	−.49
North Dakota	8.18	9.48	8.70	10.93	9.18	11.76	8.33	7.25	
Ohio	12.09	11.88	10.67	10.86	10.51	10.64	9.75	8.71	−.41
Oklahoma	10.15	11.46	10.83	9.98	11.07	9.18	10.59	8.62	
Oregon	12.16	13.03	13.10	10.37	12.12	11.54	11.57	8.91	−.39
Pennsylvania	11.98	12.05	11.64	11.12	10.70	10.92	10.06	9.32	−.37
Rhode Island	16.00	13.38	13.40	10.66	11.06	12.96	10.96	10.70	−.60
South Carolina	11.60	10.88	10.68	10.73	10.28	9.59	10.01	8.90	−.32
South Dakota	10.64	12.68	12.77	14.23	10.74	11.62	10.04	7.05	
Tennessee	8.82	8.13	8.43	8.21	8.46	8.79	7.63	7.16	
Texas	10.79	11.08	10.60	10.21	10.14	10.21	9.16	8.61	−.31
Utah	11.75	8.84	10.26	9.64	11.12	8.33	8.27	8.71	
Vermont	12.30	10.79	8.52	8.37	9.02	9.67	12.79	10.84	
Virginia	12.50	12.17	10.19	10.05	10.22	10.76	9.56	8.65	−.45
Washington	14.27	12.42	12.02	11.00	10.82	10.86	10.49	9.81	−.53
West Virginia	11.73	12.78	13.32	10.92	9.94	12.94	10.62	8.48	
Wisconsin	11.00	10.60	9.21	9.11	8.52	8.67	9.06	7.54	−.41
Wyoming	12.58	13.65	12.27	13.16	10.51	11.79	10.00	10.37	−.45
United States Total	13.73	13.47	12.97	12.39	12.09	12.20	11.42	10.58	−.42

[1] *Based on age-specific death rates per 100,000 population in groups. Computed by the direct method using as the standard population the age distribution of the United States as enumerated in 1940.*

[2] *Linear slopes are shown if statistically significant at the .05 level.*

Source: Alcohol Epidemiologic Data System. Produced using data from National Center for Health Statistics Mortality Detail Public Use Tapes for 1975–1982 and Census Bureau population estimates developed for the National Cancer Institute.

Table 2. Age-Adjusted Death Rates for Alcohol-Related Causes by States 1975–1982: Suicide

State	Age-adjusted death rate[1]								
	1975	1976	1977	1978	1979	1980	1981	1982	Regression analysis results or slope[2]
Alabama	10.33	10.31	10.40	10.03	10.72	10.87	9.75	10.55	
Alaska	19.40	19.28	20.71	15.67	12.63	16.80	14.86	11.80	–1.07
Arizona	17.39	16.60	20.37	17.70	16.59	16.20	15.97	16.77	
Arkansas	9.70	11.53	10.81	10.06	10.47	11.09	10.69	11.14	
California	17.49	16.57	16.65	15.01	14.35	13.59	13.77	14.15	–.56
Colorado	17.65	17.11	19.62	17.35	17.21	15.80	17.35	15.96	
Connecticut	10.09	9.53	8.22	9.76	8.06	8.38	8.82	7.23	–.29
Delaware	11.78	11.47	12.25	13.32	10.71	11.86	11.90	12.42	
District of Columbia	11.45	11.99	8.75	9.81	7.10	9.14	6.66	10.54	
Florida	16.58	15.57	16.50	15.14	4.46	14.12	14.08	15.08	–.31
Georgia	16.24	13.43	13.84	13.12	12.29	12.51	12.62	12.96	–.38
Hawaii	8.55	9.97	12.71	10.87	12.85	10.93	8.20	9.25	
Idaho	16.36	16.30	16.72	13.55	13.38	13.02	15.57	14.56	
Illinois	8.63	9.10	9.92	9.52	8.64	8.92	9.17	9.09	
Indiana	11.27	10.56	12.79	11.60	10.64	10.15	10.63	11.09	
Iowa	11.02	10.24	11.20	11.38	10.29	10.54	9.93	9.93	
Kansas	12.92	11.10	12.21	10.62	11.78	10.26	10.85	10.89	
Kentucky	13.65	12.37	13.38	11.81	12.75	12.55	11.51	13.15	
Louisiana	12.37	11.56	12.75	11.93	12.11	12.11	11.42	12.65	
Maine	11.96	12.33	12.10	13.31	13.87	11.89	13.68	12.48	
Maryland	10.99	11.33	11.68	10.35	10.16	10.17	9.75	9.48	–.28
Massachusetts	9.36	9.15	9.40	8.45	8.63	7.89	8.47	8.76	–.14
Michigan	12.90	13.19	13.85	12.24	12.22	11.24	11.47	11.78	–.29
Minnesota	11.70	9.95	11.39	10.04	10.07	10.53	10.43	11.02	
Mississippi	10.87	9.33	10.23	9.45	9.61	9.17	9.73	8.71	–.19
Missouri	11.31	12.44	12.67	11.52	10.95	11.36	11.29	10.84	
Montana	14.96	17.01	17.55	15.11	14.17	14.35	17.45	14.88	
Nebraska	10.40	9.40	10.28	8.51	9.61	9.35	9.99	9.67	
Nevada	26.04	24.98	27.75	22.11	21.79	21.79	23.17	27.46	
New Hampshire	13.82	12.55	13.17	14.05	10.77	10.43	13.10	11.13	
New Jersey	7.70	7.09	7.80	6.63	6.92	6.88	6.64	7.25	
New Mexico	18.31	18.98	18.66	17.21	19.02	17.44	17.93	19.77	
New York	8.02	8.87	8.68	9.08	8.88	8.84	8.24	6.98	
North Carolina	13.56	12.16	12.72	11.32	11.99	10.74	12.29	12.71	
North Dakota	9.69	10.93	10.54	10.22	11.83	10.50	8.80	10.35	
Ohio	12.37	12.27	12.64	12.27	12.32	11.59	11.81	11.33	–.15
Oklahoma	13.82	12.38	15.09	13.07	12.85	12.74	14.86	13.76	
Oregon	15.03	14.50	15.35	14.39	12.89	13.72	13.88	13.38	–.25
Pennsylvania	11.05	10.96	11.19	11.09	10.65	10.43	10.44	10.61	–.10
Rhode Island	10.61	11.26	14.07	11.23	11.48	10.51	10.83	11.05	
South Carolina	11.76	9.71	12.03	10.77	9.85	9.41	10.96	11.31	
South Dakota	9.78	12.09	10.50	11.80	9.81	12.33	12.66	13.00	
Tennessee	13.28	12.57	13.13	11.70	12.66	11.80	11.89	12.14	–.17
Texas	13.61	11.79	13.66	12.32	11.66	12.12	12.30	12.02	
Utah	14.09	14.48	14.90	13.79	13.81	14.82	14.85	14.27	
Vermont	17.75	14.81	12.33	13.71	16.98	14.26	15.63	14.55	
Virginia	15.22	15.50	15.18	13.37	14.11	12.76	12.49	13.25	–.42
Washington	13.92	14.16	13.54	13.13	13.30	12.53	14.24	12.70	
West Virginia	10.72	8.95	11.45	13.36	11.96	11.89	11.80	11.52	
Wisconsin	12.32	13.05	12.69	12.10	12.29	11.32	12.10	11.87	–.14
Wyoming	16.94	17.63	15.81	17.69	19.36	16.21	17.61	19.59	
United States Total	12.52	12.13	12.76	11.88	11.65	11.34	11.52	11.58	–.17

[1] Based on age-specific death rates per 100,000 population in groups. Computed by the direct method using as the standard population the age distribution of the United States as enumerated in 1940.

[2] Linear slopes are shown if statistically significant at the .05 level.

Source: Alcohol Epidemiologic Data System. Produced using data from National Center for Health Statistics Mortality Detail Public use Tapes for 1975–1982 and Census Bureau population estimates developed for the National Cancer Institute.

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Motor Vehicle Accidents

The death rate from fatal motor vehicle accidents, illustrated in Figure 1, increased up to a peak of 23.13 in 1979 and then declined to 19.15 in 1982. Although there was not a significant trend for the Nation as a whole, declines were found in nine States—Alaska, Iowa, Alabama, Virginia, Michigan, North Carolina, Tennessee, Kentucky, and the District of Columbia. Increases were observed in Florida and Oklahoma.

The decline in motor vehicle accident death rates in the last 4 years is particularly important because Department of Transportation (DOT) data show that traffic volume increased over this period (NHTSA 1985). In fact, when adjusted for the average number of vehicle miles driven, the increase in motor vehicle accident death rates from 1975 through 1979 disappears, and the decline in the more recent years becomes even steeper. Thus the increase in gasoline prices and the 55-mile-per-hour speed limit cannot account for the change. Two possible explanations are offered by DOT: (1) stricter laws and tighter enforcement on drinking and driving, and (2) higher minimum drinking ages. Recent data from the Insurance Institute for Highway Safety (1985) show that nighttime fatal highway crashes, a class of accident frequently involving alcohol, have decreased in States where the minimum legal drinking age has been raised.

The States that were highest in deaths from motor vehicle accidents were New Mexico, Wyoming, Nevada, Oklahoma, and Montana. Relatively higher driving speeds in the West may play a role, but the age mix of drivers in different States also varies. New Mexico and Wyoming, for example, rank high in the percentage of licensed drivers who are under 25 (FHA 1981).

Alcoholism

Deaths from alcoholism, including diagnoses of "alcohol-dependence syndrome," reached an 8-year high in 1980 at 25 per million population, age adjusted. Significant decreases were found in seven States, but significant increases occurred in five States. The States where alcoholism death rates decreased were Alaska, Utah, New Mexico, New Hampshire, Mississippi, Indiana, and West Virginia. Increases were found in Florida, Illinois, New Jersey, Iowa, and California.

New Mexico led the nation in the rate of alcoholism deaths for most of the 8-year period, and Alaska ranked second. Alaska is high in per capita consumption of alcohol (AEDS 1985c), and New Mexico ranks high in the number of alcoholism treatment patients per capita (based on the 1982 NDATUS).

Homicide

For the total United States, the homicide mortality rate followed an irregular pattern from 1975 to 1982, first decreasing, then increasing, and finally decreasing again. However, clear decreases were found in six States (North Carolina, Virginia, Georgia, Michigan, Kentucky, and Idaho). Increases were observed in four States (Texas, New York, Louisiana, and Connecticut).

Over the 8-year period, homicide rates were highest in the District of Columbia, Louisiana, Texas, Mississippi, Alabama, Florida, and Georgia.

Conclusion

In general, the declining trends in alcohol-related mortality are encouraging. The largest single change has been the decrease in deaths from chronic liver disease and cirrhosis, which was found in 33 States as well as in the overall national data. A significant, but small, decline was also found in the suicide death rate.

A majority of the State-level trends over the 8-year period were also in the direction of reduced levels of mortality from the other major alcohol-related causes studied here, and the rates for all five causes decreased in the last 2 years.

Most important in terms of lives lost is the decline in the motor vehicle accident mortality rate. This decline cannot be explained by changes in traffic volume. The trend in traffic fatalities suggests that efforts to reduce drinking and driving may have begun to pay off. It should be noted that more recent data from the Fatal Accident Reporting System (1985) reveal increases in motor vehicle traffic accident deaths in 1984. These data, however, have not yet been adjusted to take account of possible changes in traffic volume and may differ from the NCHS data used in the current analysis, because FARS does not include accidents occurring off the roadway.

If changes in minimum drinking age statutes and in sanctions for DWI are responsible for the decreases seen between 1975 and 1982, then State legislation enacted during 1985 should reduce further the carnage on our highways. □

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Epidemiology Data Reported

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with cancers of the esophagus, stomach, pancreas, lungs, kidney; wine with pharyngeal cancer (Cook-Mozaffari 1982; Hinds et al. 1980); red wine with gastric cancer (Hoey et al. 1981); the Chinese hard liquor samshu with esophageal cancer (deJong et al., cited in Tuyns 1982); and beer with colorectal cancer (Breslow and Enstrom 1974; Cook 1971; Enstrom 1977; Pollack et al. 1984). This last association is disputed; a large study (n = 9,920) of alcohol consumption in five ethnic groups (Hinds et al. 1980) failed to support it. Tuyns (1982) argues that this particular association remains "an open question."

—Thomas Prugh, NCALI

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Epidemiologic Bulletin No. 11:

Decline in Liver Cirrhosis Mortality and Components of Change: United States, 1973–1983

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John Noble, B.A.
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Editor's note: *In this article the authors use the terms "chronic liver disease" and "cirrhosis of the liver" for those conditions that fall under the diagnostic category entitled "Chronic Liver Disease and Cirrhosis" in the ninth edition of the International Classification of Diseases.*

Mortality from cirrhosis of the liver was ranked as the ninth leading cause of death in 1983. According to mortality data from the National Center for Health Statistics (NCHS 1985), in 1983, 2,019,201 people died in the United States. Of these deaths, nearly 28,000 were attributed to liver cirrhosis.

Cirrhosis mortality in the United States increased steadily following the end of Prohibition (1933) until 1973, when the age-adjusted rate of death peaked at 15.0 per 100,000 population (Figure 1). A steady decrease ensued until 1983, when the age-adjusted mortality rate had dropped to 10.2 per 100,000.

Reasons for the decline in cirrhosis mortality are not known, and no adequate explanation is available. Because of advances in medical treatment, the quality of life for individuals who have the disease may have been enhanced, and successful preventive programs may have reduced the magnitude of the population at risk for developing liver cirrhosis.

Any complete explanation for the general downward trend in cirrhosis mortality rates would take into account the categories of liver cirrhosis and the mortality trends for each of these. Figure 2 shows the two International Classification of Diseases (ICD) schemes used since 1968 to codify cirrhosis deaths. Between 1968 and 1978, liver cirrhosis deaths were classified as (1) alcohol-related (ICD-8: 571.0) or (2) nonalcohol-related, including other specified (ICDA-8: 571.8) and unspecified (ICDA-8: 571.9) liver cirrhosis without mention of alcohol (NCHS 1968).

In the Ninth Revision of the ICD (World Health Organization 1978), all three major categories of liver cirrhosis were further divided into the following subcategories: alcoholic fatty liver (571.0); acute alcoholic cirrhosis (571.1); alcoholic cirrhosis of the liver (571.2); alcoholic liver damage-unspecified (571.3); chronic hepatitis (571.4); cirrhosis of the liver without mention of alcohol (571.5); biliary cirrhosis (571.6); other chronic nonalcoholic liver disease (571.8); unspecified chronic liver disease without mention of alcohol (571.9); and portal hypertension (572.3). For illustrative purposes, ICD-9 subclassifications of alcohol-related cirrhosis (571.0, 571.1, 571.2, and 571.3), other specified cirrhosis (571.4, 571.6, 571.8, and 572.3), and unspecified liver cirrhosis (571.5 and 571.9) have been cross-classified with their ICDA-8 counterparts to allow comparison of rates since 1979 with those before 1979 (Colliver et al. 1984).

As can be seen in Figure 2, it is clear that the classifications of cirrhosis mortality did not contribute equally to the overall decline in liver cirrhosis since 1973. The annual mortality rates associated with the categories of cirrhosis without mention of alcohol, encoded 571.8 and 571.9, declined 61.6 and 26.6 percent respectively between the years 1973 and 1983. The age-adjusted rate for alcohol-related cirrhosis encoded 571.0, was 4.4 per 100,000 in 1983, a reduction of only 20.1 percent since 1973 when the rate was 5.9 per 100,000.

The overall decline in each category of liver cirrhosis during the past decade applied to each major race-sex group of the population. As can be seen by comparing Figures 3 through 5, the most dramatic change in cirrhosis mortality was evidenced in the "other specified" category, in which death rates were shown to decrease 67.1, 55.4, 64.8, and 60.8 percent respectively for white males, white females, nonwhite males, and nonwhite females. Reductions in alcohol-related and unspecified cirrhosis mortality rates were generally much less than those associated with specified cirrhosis, averaging 29.7 and 31.3 percent respectively.

Since overall cirrhosis mortality has been declining, the relatively rapid decline in the categories of cirrhosis deaths without mention of alcohol may reflect a true decrease in cirrhosis deaths from causes other than alcohol. On the other hand, this decline may reflect a greater willingness on the part of physicians to designate cirrhosis deaths as alcohol-related. The result would be to accelerate the decline in mortality rates for nonalcohol-related cirrhosis while decelerating the decline in alcohol-related mortality rates.

There also exists the possibility that the decline in liver cirrhosis mortality rates attributed to each category of cirrhosis may not be real or may not be the consequence of past biases in the assignment of liver cirrhosis deaths but rather artifactual: The result of changes in rules, procedures, or classification of cause of death introduced when ICD-9 went into effect in 1979.

As a preliminary test of the latter hypothesis, percent-change statistics were

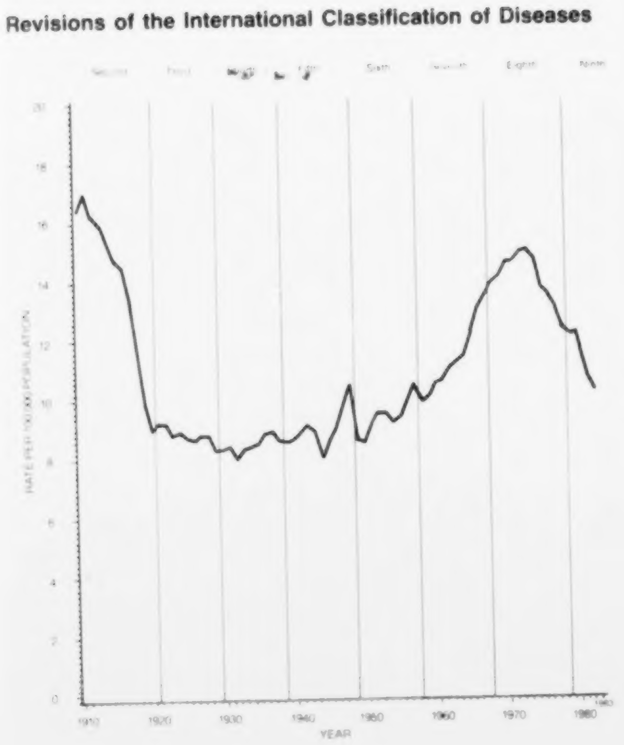

Figure 1. Age-Adjusted Death Rates for Liver Cirrhosis (all 571): Death Registration States, 1910–1932, and United States, 1933–1983

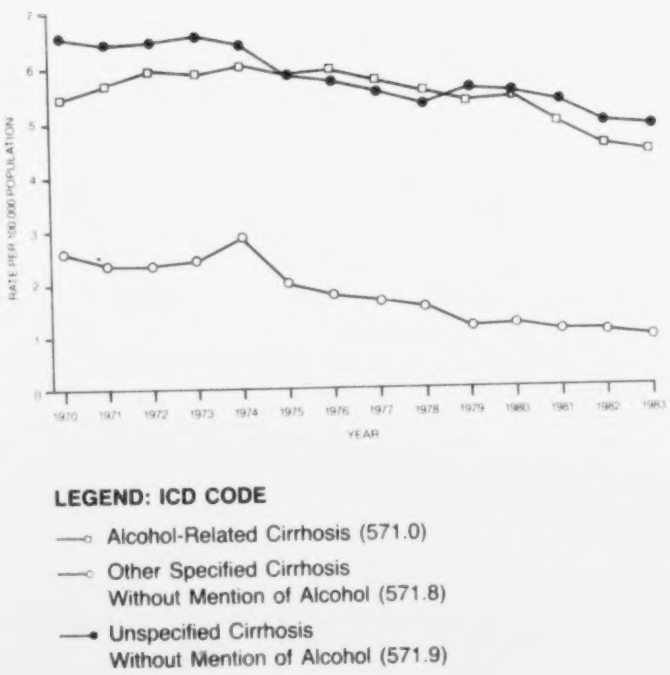

Figure 2. Age-Adjusted Death Rates for Liver Cirrhosis by Fourth-Digit ICD Code: United States, 1970–1983.

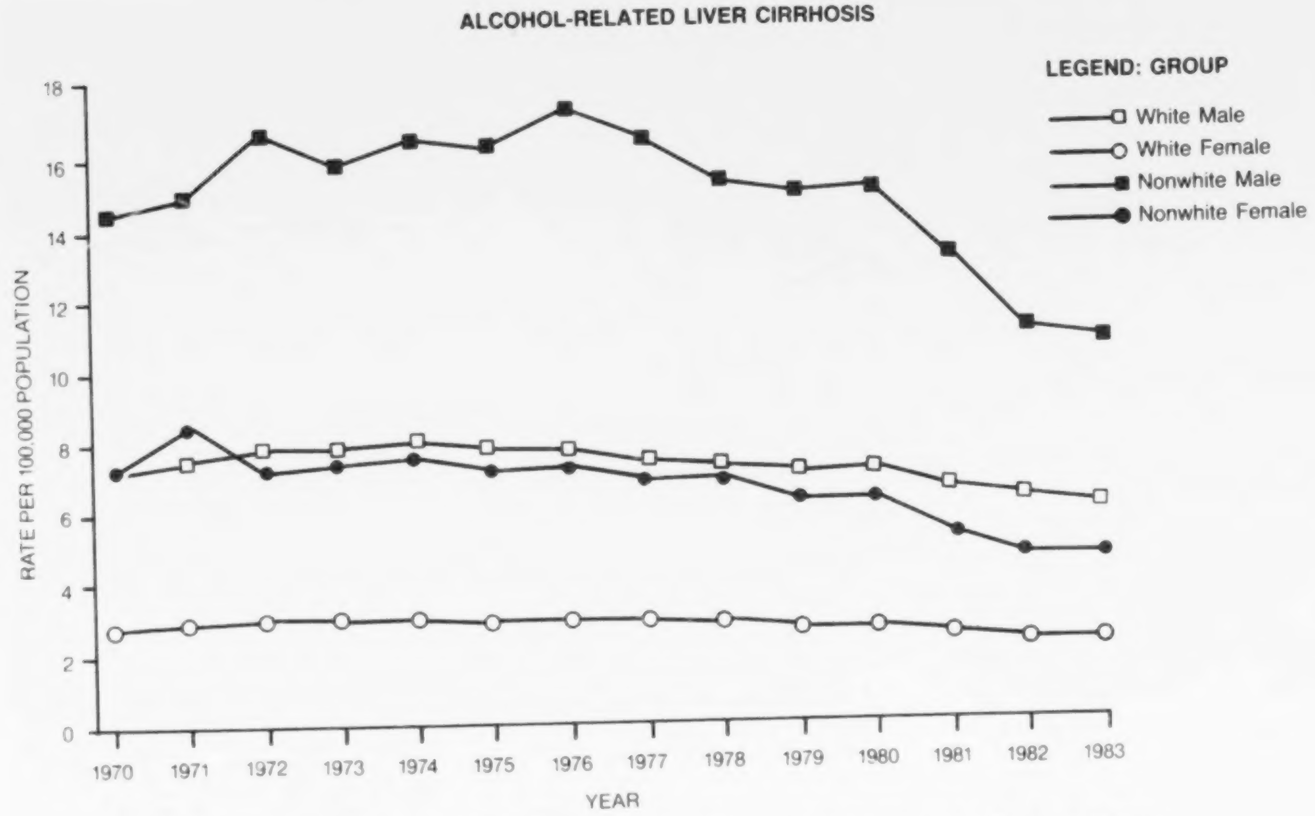

Figure 3. Age-Adjusted Death Rates for Alcohol-Related Liver Cirrhosis (ICD: 571.0) by Race and Sex: United States, 1970–1983

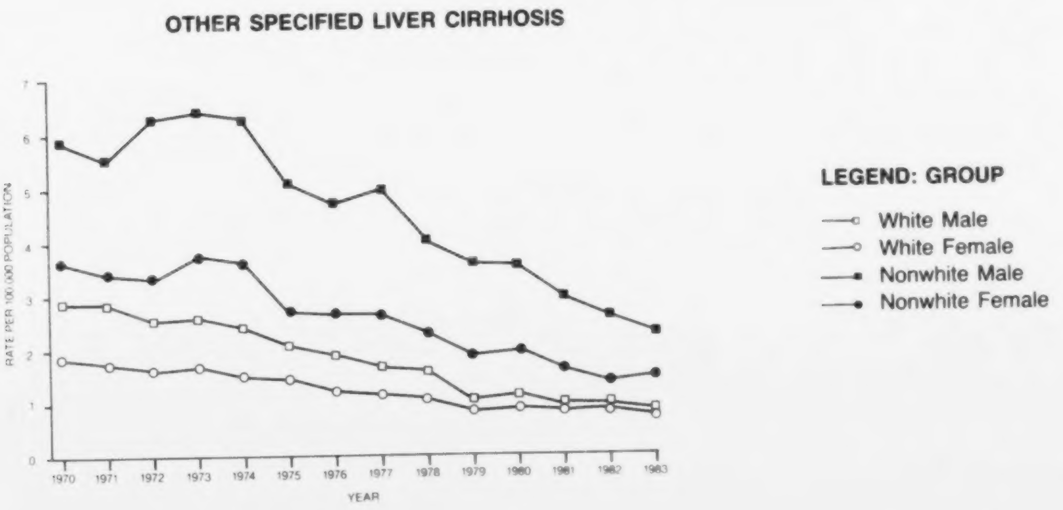

Figure 4. Age-Adjusted Death Rates for Other Specified Liver Cirrhosis (ICD: 571.6) by Race and Sex: United States, 1970–1983

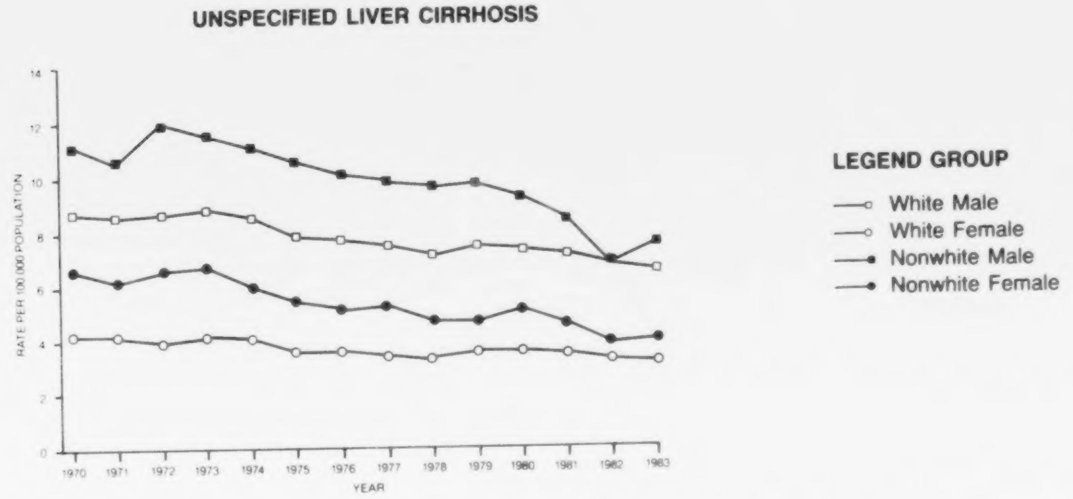

Figure 5. Age-Adjusted Death Rates for Unspecified Liver Cirrhosis (ICD:571.9) by Race and Sex: United States, 1970–1983

examined separately for the years in which the ICDA-8 and ICD-9 were used to codify causes of death. Table 1 shows the percent change in age-adjusted rates for each major category of liver cirrhosis experienced by each race-sex group for these two periods, 1973–1978 and 1978–1983. The percent-change statistics indicate that mortality rates for cirrhosis classified as alcohol-related dropped approximately four times as much between 1978 and 1983 (using the ninth revision of the ICD) in comparison with the previous 5 years (when the ICDA-8 served as the standard classification for cause of death statistics).

Except for data on nonwhite males, the opposite trend was apparent for deaths coded as unspecified liver cirrhosis: percent changes decreased for the other three groups when ICD-9 was used. Overall percentage reductions in the rate of other specified liver cirrhosis were nearly identical during the two time periods and were quite consistent among the four race-sex populations.

The pattern of percent-change statistics shown in Table 1 suggests that many liver cirrhosis deaths assigned to the alcohol-related category using the ICDA-8 may

Table 1. Percent Change in Age-Adjusted Death Rates for Liver Cirrhosis With and Without Mention of Alcohol: United States; 1973–1978 (ICDA-8), 1978–1983 (ICD–9), and 1973–1983 (ICDA–8, ICD–9)

		Age-Adjusted Rate			Percent Change		
ICD Category	Group	1973	1978	1983	1973-1978	1978-1983	1973-1983
Alcohol-Related Cirrhosis (571.0)	Total	5.90	5.56	4.42	–5.76	–20.50	–25.08
	White Male	7.77	7.22	6.06	–7.08	–16.07	–22.01
	White Female	2.91	2.76	2.14	–5.15	–22.46	–26.46
	Nonwhite Male	15.74	15.26	10.70	–3.05	–29.88	–32.02
	Nonwhite Female	7.34	6.96	4.54	–5.18	–34.77	–38.15
Nonalcohol-Related Cirrhosis							
Other Specified Cirrhosis (571.8)	Total	2.42	1.51	.93	–37.60	–38.41	–61.57
	White Male	2.58	1.57	.85	–39.15	–45.86	–67.05
	White Female	1.66	1.06	.74	–36.14	–30.19	–55.42
	Nonwhite Male	6.42	4.00	2.26	–37.69	–43.50	–64.80
	Nonwhite Female	3.75	2.30	1.47	–38.67	–36.09	–60.80
Unspecified Cirrhosis (571.9)	Total	6.62	5.31	4.86	–19.79	–8.47	–26.59
	White Male	8.87	7.21	6.58	–18.71	–8.74	–25.82
	White Female	4.13	3.27	3.13	–20.82	–4.28	–24.21
	Nonwhite Male	11.54	9.68	7.60	–16.12	–21.49	–34.14
	Nonwhite Female	6.73	4.68	3.96	–30.46	–15.38	–41.16

have been coded to unspecified cirrhosis according to the ICD-9. This shift in the classification of cirrhosis deaths could be attributed to a change in coding or classification procedures introduced by the ICD-9. However, the stability of percent-change statistics for unspecified cirrhosis in the nonwhite male population between 1973–1978 and 1978–1983 may point, in part, to a true decrease in alcohol-related cirrhosis death rates in this subpopulation over the past decade. To determine whether this is the case, it will be necessary to separate true changes from those that are artifactual.

Separating these change categories remains a recalcitrant problem for epidemiologists. Changes in death rates for liver cirrhosis that do not reflect true changes in mortality could possibly result with each successive revision of the ICD. Although discontinuities in the trend have been investigated in studies in which matched diagnoses for overall liver cirrhosis have been compared (comparability ratio: 1.011) under the eighth and ninth revisions of the ICD (NCHS 1980), the results of the comparability study for fourth-digit liver cirrhosis subclassification codes have yet to be released. When these results become available, it may be possible to calculate the degree of error in the certification of alcohol-related, other specified, and unspecified cirrhosis deaths. Knowledge of the degree of error would further clarify the changing relationships observed in percent-change statistics among the major categories of liver cirrhosis between the years 1973 and 1983. ☐

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The Suspected Role of Congeners

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may be implicated in drinking-related cancers. Alcohol itself may thus be a cocarcinogen, a promoter, or a vehicle bearing the causal agent (Hoey et al. 1981; Lieber 1982; Tewari and Carson 1982).

Known or suspected carcinogens have been found in many types of alcoholic beverages. Various nitrosamines, for example, have been detected in many beers, in some Scotch whiskies, and in ciders and brandies made from apples in certain regions of France (Goff and Fine 1979; Tuyns 1982). Nitrosodimethylamine (NDMA) is nearly ubiquitous in beer and has an affinity for the esophagus, although the importance of the cancer risk "remains to be evaluated" (Tuyns 1982). A related compound, nitrosodiethylamine, exists in relatively high levels in the apple-based drinks made in Brittany and Normandy, where esophageal cancer is common. Nitrosodiethylamine has been shown to be carcinogenic in laboratory animals (Lieber 1982).

Dark beers seem to be associated with higher risk than light beers (Potter et al. 1982), a fact that is consistent with the higher level of nitrosamines in dark beers. Spiegelhalder and colleagues (1979) analyzed 158 samples (mostly German beers) and found 70 percent to be contaminated with NDMA. The lowest levels of NDMA were found in Pilsen lagers, pale export lagers, and top-fermented pale ales; "strong" beers and beers subject to high temperatures during kilning or curing contained higher concentrations. The highest levels of NDMA were found in beers made from smoked malt.

It has been suggested that the relationship between beer drinking and bowel cancer may be mediated by other contaminants in addition to nitrosamines, such as polycyclic aromatic hydrocarbon compounds (Potter et al. 1982). These compounds are produced by the roasting of grains during beer production. Animal studies have shown that one such compound, benzo(alpha)pyrene, can induce esophageal papillomas and carcinomas when administered in ethanol solution (Horie et al., cited in Tuyns 1982). The effect was not seen when the animals were given ethanol alone, or when the carcinogen was administered in water.

Other studies have brought to attention additional contaminants as possible agents in the etiology of a variety of cancers. According to Duncan and Smythe (1982), the relationship between drinking and breast cancer may involve the presence of salsolinol in fermented alcoholic beverages, including beer, table wine, and fortified wine. Salsolinol is a dopamine-derived alkaloid that is known to stimulate prolactin release in rats. It is thought by some (Williams, cited in Rosenberg et al. 1982) that excessive prolactin release may be implicated in human breast cancer. Fusel oils, which are distillation byproducts responsible for many of the distinctive tastes of different liquors, can cause papillomas and carcinomas of the upper alimentary tract in animals (Gibel et al., cited in Tuyns 1982). Hoeft and Obe (1983) have demonstrated in vitro induction of chromosomal aberrations in human peripheral lymphocytes through the application of nonalcoholic residues extracted from distilled beverages. The authors note that alcoholics suffer higher frequencies of such aberrations than do nonalcoholics, and that this finding is consistent with the greater risk of various cancers in alcoholics. Finally, some studies suggest that ingestion of asbestos fibers (from filters used in the production of beverages) may be a factor in the gastrointestinal cancers; such fibers have been detected in wine (Gaudichet et al. 1978), beer (Biles and Emerson, cited in Potter et al. 1982), and gin (Wehman and Plantholt 1974).

The actual effect of congeners and contaminants in alcoholic beverages on the development of cancer is not yet certain. Lieber (1982) points out that the apparent carcinogenic effects of contaminants might be caused by secondary consequences of high alcohol consumption such as dietary imbalances or immune system impairment. Tuyns (1982) hypothesizes that either long-term drinking may degrade the liver's ability to metabolize carcinogens or ethanol may contribute to the activation of procarcinogens. For the moment, the unraveling of these mysteries awaits further research.

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Research Reports

Stress, Ulcers, and Alcohol

Treatment outcomes for ulcer patients can be predicted by measuring the patients' stress levels at the time of diagnosis, according to Joycelyn Whiten, Ph.D., Los Angeles neuroscientist and former career teacher in the NIAAA-NIDA program. Speaking in a recent seminar cosponsored by NIAAA's Division of Extramural Research and the NIMH Staff College, Whiten presented a holistic interpretation of stress and discussed her research interests as director of the Appetitive Disorders Research Institute, Drew Postgraduate Medical School and Martin Luther King, Jr. General Hospital.

Whiten's stress tests are questionnaires that yield a score, between 0 and 4, based on a multitude of factors in the individual's personal, family, social, and work experiences. In collaboration with Peter Bright-Asare, M.D., a gastroenterologist, she has found that high stress scores are positively correlated with measures of gastric acid output and with failure of ulcers to heal after 6 weeks of conventional treatment. In particular, an ulcer patient scoring close to 4 on the stress tests will need psychotherapy in addition to the antacid medication. Some who score at a high level may eventually need surgical intervention.

In her recently completed study of 40 patients (see accompanying table), how did the 30 healed subjects differ from the 10 who did not heal? Responding to this question, Whiten pointed out that learned expectations—such as fear or dread—can turn out to be self-fulfilling prophecies. In addition, Whiten says, the individual who develops an ulcer and fails to heal may have lacked opportunities to learn effective coping skills. Even some of the healers among her subjects benefited from group followup sessions in which they discussed their own experiences and described various coping strategies.

Whiten noted that all of the ulcer patients in her study linked particular life events with development of the lesion. This does not mean, she said, that the events themselves caused the ulcers: "The way the input is managed is what constitutes stress." Thus, her theoretical approach to stress is interactive, with the patient responding to internal or external events in an individual way.

As a neuroscientist who works with people rather than with laboratory animals, Whiten emphasizes both positive and negative aspects of stress in real-life situations. "Stress," she says, "can be very productive. It makes us move. It is an adaptive mechanism." In her theoretical framework, Whiten assigns important roles to memory and cognition. "You react to what you remember," she says. The brain substrate of these processes is thought to be the limbic system, which appears to interpret events as rewarding or punishing and then to store the impressions in memory. In this sense, Whiten goes beyond earlier biological theories of stress that restricted their explanations to physiological processes in the nervous system and hormone systems.

However, the endocrine functions of the pituitary and adrenal glands cannot be ignored, Whiten adds. With special reference to emotional stress, she explained it as "generated during conflict situations when a subject—human or animal—fails to satisfy a dominant biological or social need for an extended period of time. Should the situation be sustained, the stress can take a pathological form." The form it takes, according to Whiten, depends on interaction among various body systems as the individual attempts to cope with conflicting demands.

On the subject of alcohol and stress, Whiten found that most of the ulcer patients in her study had once been heavy drinkers, before the pain of the lesion had led them to avoid alcohol. But the causal connection between stress and alcohol is not one-way, she said: "Stress can lead to drinking, for temporary relief; but drinking causes stress, not only for the drinker but also for other people—a ripple effect."

Whiten's interest in gastrointestinal disorders is not limited to alcohol effects, but she is interested in utilizing this as a model system in which to study basic actions of alcohol. Other researchers may develop animal models, but Whiten reminded her audience that "the gut is where we first feel stress." In addition, because alcohol has a direct damaging effect on the gastric mucosa and also alters the immune system, Whiten believes that understanding the gastrointestinal effects of alcohol use and abuse can lead to better understanding of a wide variety of diseases and disorders, including cancer. □

—*Dorothy T. Moore, Ph.D.*

Average stress test scores and gastric acid output measures for 40 ulcer patients and 12 control subjects before and after treatment (BAO = basal acid output; PAO = peak acid output).

	Stress Scores		BAO		PAO	
	Before	After	Before	After	Before	After
Healed Patients (n = 30)	1.10	0.00	6 ± 1.00	3 ± 0.50	32 ± 8	30 ± 10
Nonhealers (n = 10)	3.50	3.30	12 ± 2.00	10 ± 4.00	60 ± 3	55 ± 4
Controls (n = 12)	0.50	0.25	3 ± 0.05	3 ± 0.30	30 ± 1	30 ± 1

Source: J.T. Whiten, Ph.D. (Personal Communication)

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News Notes

Alcoholic Executives

A study recently released by the Alcoholism Council of Greater New York contends that many corporations are "still in the dark ages" with respect to alcoholism, according to the Council's president, Denis J. O'Leary, M.D. The 2-year study, conducted on a nonrandom sample of 62 recovering alcoholic executives (46 men and 16 women) drawn from the New York Alcoholics Anonymous community, employed interviews to obtain information about participants' work and drinking histories, performance on the job, awareness of their drinking problems, intervention pathways, and current status. All those chosen to take part had held positions as general manager, vice president, president, or chief executive officer (CEO) while drinking actively, and had been abstinent for at least one year when interviewed. Some highlights of the study are summarized below:

- Subjects' employers included Fortune 500 companies, major New York City companies, and smaller firms. Average age of interviewees was 51 for males and 44 for females. One-half of the males, but only 19 percent of the females, were married. Career categories represented in the group included communications, finance, service, manufacturing, and sales.
- During their active alcoholism, 59 percent of the subjects attained the rank of vice president, 33 percent general manager, and 8 percent president or CEO. The corresponding figures at the time of interview were 45 percent, 32 percent, and 23 percent. The study cautions against assuming that successful recovery led many vice presidents to be promoted; subjects' career changes were "much more complex" than that.
- In this sample, female subjects arrived at all drinking history "milestones" (first drink, first drunk, first trouble, first awareness of trouble, readiness for help, recovery) at the same time or earlier ages than the male subjects. The greatest age difference occurred at the "ready for help" point: males averaged 42 years, females 31.
- Only 4 of the 62 subjects reported being told by a physician, psychiatrist, or other health professional that they were alcoholic.
- Over four-fifths of the women and three-fifths of the men used psychoactive drugs in addition to alcohol at some point. Fifty-five percent of all subjects were cross-addicted.
- The crisis events or experiences cited most frequently by both sexes were trouble at work and feelings of hopelessness; however, women cited hopelessness first (44 percent) and work crises second (25 percent), while men put work crises first (39 percent) and hopelessness second (24 percent).
- Among married subjects, nearly three-fourths of the wives of male subjects took part in some sort of alcohol-specific therapy, but none of the husbands of married female subjects did.
- All subjects reported declines in performance that were generally ignored or excused because of their executive status.

The study concludes, ". . . the perceived low rate of executive recovery is largely due to a lack of knowledge about alcoholism at the top management level and a permissive attitude towards the executive who develops troubling changes in job performance.

"Therefore, we believe it is possible to develop executive recovery programs to resolve these problems and improve intervention and recovery at the executive level."

For further information on the study, contact Charles E. Shirley, Alcoholism Council of Greater New York, Inc., 133 East 62nd Street, New York, NY 10021. □

—Thomas Prugh

Support Group for Recovering Veterans

Graduates of the Bay Pines (FL) Veterans' Administration Medical Center's Alcohol Dependence Treatment Unit have formed an alumni association along the lines of a self-help, mutual support group for recovering military veterans. The nonprofit group promotes the continuing fellowship of its members and the well-being of the treatment unit itself. Services include a monthly newsletter, reference materials on public treatment centers nationwide, and a speakers bureau. The association also arranges special events for treatment unit inpatients.

The group is believed to be the first independent veterans' alcohol recovery and support association affiliated with a VA program. Associate membership is available to U.S. veterans who are graduates of comparable public, private or VA alcohol dependence treatment programs elsewhere.

For more information, contact the Bay Pines A.D.T.U. Alumni Association, Inc., P.O. Box 593, Bay Pines, FL 33504-0593. □

—Thomas Prugh

Alcoholics Anonymous and Prison Inmates

Research among prison populations suggests that psychiatric problems, including alcohol and drug abuse, are more common in the lives of felons than in the general population. A 1983 study by James Collins and William Schlenger of the Research Triangle Institute, for example, examined a sample of 1,149 male felons for lifetime prevalence of 15 different psychiatric disorders. The lifetime prevalence rate for alcohol abuse or dependence among the prisoners was 49.5 percent, more than twice the rates for either of two control samples drawn from the general population.

Alcoholics Anonymous (AA) is one of the organizations working to reach inmates with alcohol problems. Since 1942, beginning at San Quentin prison, AA members have gone into correctional facilities to describe the message and purpose of the organization. By AA estimates, there are now more than 1,600 active AA groups in jails and prisons, with a membership of about 48,000.

Services are not limited to personal contact with alcoholic inmates. AA members and local service committees will also schedule speakers for within-the-walls AA meetings and offer support to prisoners upon release, through the prerelease sponsorship program. Local AA groups have historically cooperated with courts and safe-drivers programs in seeking ways to reduce the incidence of alcohol problems in drivers arrested on charges of driving while intoxicated. AA's Institutions Correspondence Service promotes the exchange of letters between inmates and AA members on the outside; hundreds of AA members are active participants in this program.

For more information on AA correctional programs, contact the Alcoholics Anonymous General Service Office, P.O. Box 459, Grand Central Station, New York, NY 10163. ☐

Thomas Prugh

Safety Update

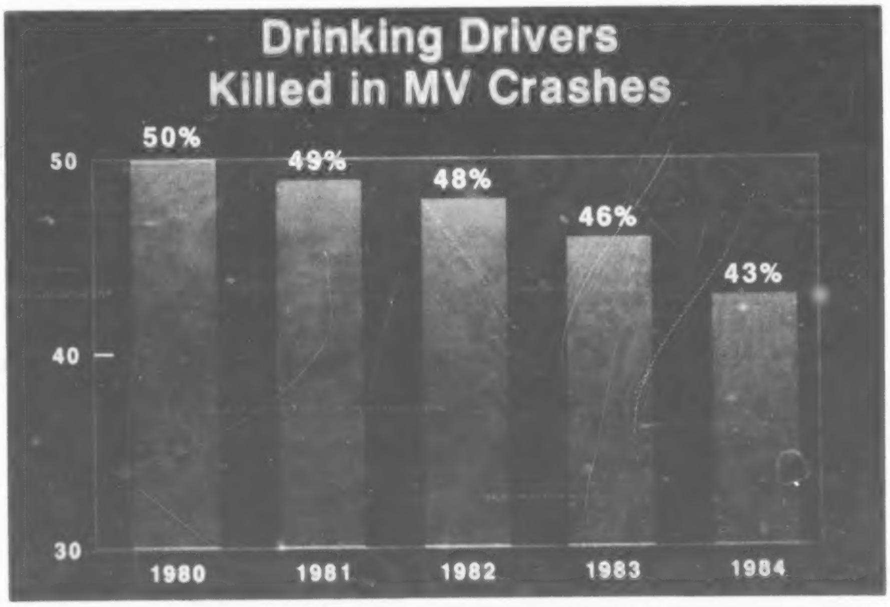
Drunk Driver Fatalities Declining

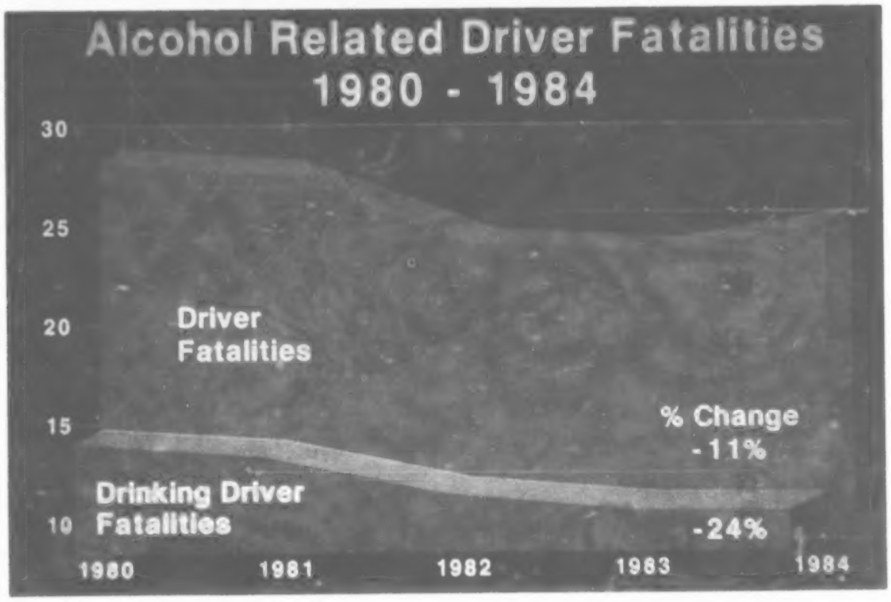
Total traffic fatalities in the United States increased by 4 percent between 1983 and 1984, and driver fatalities went up to 6 percent. Despite these increases, the total number of deaths among intoxicated drivers actually declined during the period, according to statistics compiled by the National Center for Statistics and Analysis (NCSA) of the National Highway Traffic Safety Administration.

The decline is part of a longer trend which began in 1980. As the table below illustrates, the 5-year period from 1980 to 1984 saw a steady falling off of both the percentage and the total number of fatally injured drivers who were intoxicated at the time of the accident. The table reflects estimates from data reported by a sample of 15 States that consistently test for blood alcohol concentration in 80 to 90 percent of driver fatalities. Data from the remaining States, although they test less thoroughly, tend to support the sample State data. NCSA estimates that more than half of all fatal accidents involve a drinking driver or pedestrian.

For further information, contact James C. Fell, National Center for Statistics and Analysis/Research and Development, NRD-32, 400 Seventh Street, S.W., Washington, DC 20590. ☐

—*Thomas Prugh*





APHA Section Status Official

At the American Public Health Association's (APHA) annual meeting in November 1985, the Forum on Alcohol and Drugs became an official Section of the Association. Alexander C. Wagenaar, Ph.D., was elected acting chairperson of the Section and chairperson of the nominating committee. As a Section, members can make general recommendations for the annual meeting programs, originate resolutions for consideration, and advise on the publications of papers presented at the Section meetings. The presence of a Section on Alcohol and Drugs enables the Association to address alcohol and drug problems from the perspective of public health, and offers the opportunity to provide national leadership in this area.

Membership in the APHA Alcohol and Drug Section offers professionals the opportunity to share ideas and information through the annual meeting, the Section newsletter, and a network of professional members from all public health disciplines. As an example of the activity of the Section, some 13 scientific sessions and two poster sessions were sponsored at APHA's annual conference in 1985. In addition, resolutions sponsored by the Section were passed by the APHA Governing Council on the issues of Fetal Alcohol Syndrome awareness and alcohol advertising. This year, Section members are considering resolutions on issues such as the following: increased Federal funding for research, especially in the area of prevention; smokeless tobacco; rotated warnings on all alcohol products and advertisements; and policies concerning other drugs—e.g., the connection between AIDS and drug use.

If you are interested in joining the Section, contact Alexander C. Wagenaar, Ph.D., Chairperson, Section on Alcohol and Drugs, The University of Michigan, 2901 Baxter Road, Ann Arbor, MI 48109-2150, or call (313) 763-2466.

Occupational Arena

Employee Assistance Programs and Alcohol-Related Costs

Hazelden Research Service has published a study, entitled "Finding the Bottom Line: The Cost-Impact of Employee Assistance and Chemical Dependency Treatment Programs," that reviews much of the research to date on the effectiveness of treatment in reducing the costs of alcohol and drug problems to employers and society at large. Divided into three sections, the report begins with a brief discussion of the evolving health care environment and efforts to control health care costs in general. It includes careful definitions of several related but distinct terms, such as cost containment (strategies used by purchasers of health care to keep costs down); cost-impact/offset (the effect on cost savings of providing a particular service); cost effectiveness (the cost of obtaining a desired outcome); and cost-benefit analysis (the comprehensive comparison of all program benefits with all costs).

The second section reviews research on the costs incurred through the abuse of alcohol and other drugs, with respect to treatment, mortality, health and medical services, reduced productivity, lost employment, motor vehicle accidents, fire, crime, and social welfare programs. It discusses each category in detail and includes data and projections from a Research Triangle Institute study that pegged total 1983 costs at nearly $117 billion.

The third section presents evidence for the effectiveness of chemical dependency treatment in reducing the many abuse-related costs. A variety of studies is described showing better work performance, fewer sick or absent days, reduced ambulatory health care utilization, declines in alcohol-related arrests, fewer physician office visits, and less disability compensation received, on the part of clients treated in employee assistance or other programs. (Examples of "typical" improvements are depicted in the accompanying table and graph.) The authors argue that "the introduction of an employee assistance program into a company may result in an increase in the number of employees receiving chemical dependency and mental health treatment. But in the long run the increased productivity and health of these employees will *offset* the cost of the employee assistant program *and* the treatment costs."

Copies of the 70-page report are available from Hazelden Research Services, 1400 Park Avenue South, Minneapolis, MN 55404. ☐

—Thomas Prugh

Burlington-Northern EAP Study Job Performance Changes

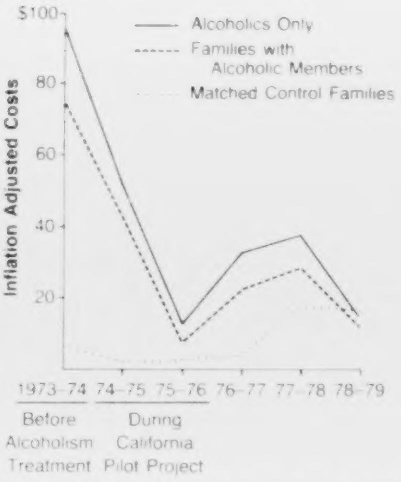
Indicators (Previous Month)	At Intake** (N = 646)	At 3 Months Follow-up (N = 501)	At 12 Months Follow-up (N = 464)
Used health insurance	17%	8%*	5%
Arrived late for work	17%	5%*	3%
Left work early	13%	4%*	3%
Took sick days	18%	7%*	8%
Used medical leave	4%	<1%	2%
Had an accident on the job	2%	<1%	1%
Used short-term disability	1%	<1%	<1%
Used worker's compensation	1%	<1%	<1%
Absent for other reasons	13%	4%	14%
Filed a grievance	1%	—	—
Job Performance Ratings (Previous Month)			
Improved	2%	45%	39%
Stayed the same	41%	22%	23%
Worsened	28%	2%	3%
Unknown	28%	31%	35%
Job In Jeopardy			
Yes	25%	7%*	4%
No	48%	65%	63%
Unknown	27%	28%	33%

**These differences between intake and follow-up responses were statistically significant at the .01 level for a matched group of 225 clients completing both the intake and three month follow-up forms.*

***In order to increase the sample size, intake data were included on a twelve-month sample of clients: July, 1982–June, 1983.*

Average Medical Care Costs Per Month Per Individual 1973–1979*

Blue Cross Blue Shield of California Enrollees from State Employees

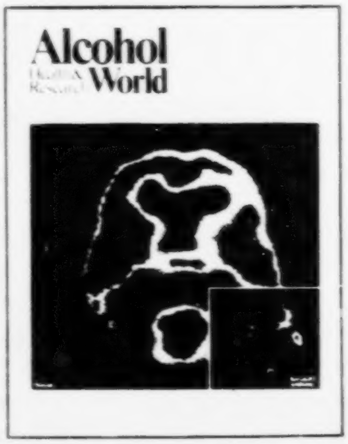


**Inflation Adjusted to 1975 Base (Holder & Hallan, 1981)*

recent issues

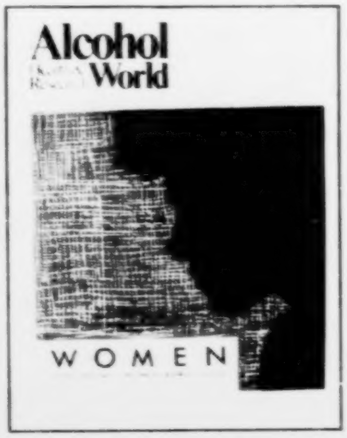
Alcohol Research

A fascinating look inside the world of modern alcohol research. World took readers inside the laboratories, clinics, and classrooms where researchers are gathering data to help diagnose, prevent, and treat alcohol problems. Plus a special article on research dissemination.



Women and Alcohol

The latest research findings on drinking patterns and problems among women were reviewed. Also included were articles on children of alcoholics, health insurance coverage for alcoholism, and alcoholism treatment. The magazine's regular columns rounded out the issue.



Children of Alcoholics

This issue focused on new research and programmatic advances for children of alcoholics. Articles by researchers, program planners, school officials, counselors, and family theorists made this one of the most popular issues ever. A wealth of information.

Alcohol
Health & Research
World

upcoming issues

Server Responsibility

What is server responsibility? Are businesses and social hosts liable, and under what circumstances? What new intervention programs are being developed? We'll let you know what key people in government, business, and the legal profession have to say about these important, timely issues.

Recovery

What is research showing about recovery from alcohol problems? What biomedical changes and psychological changes take place during recovery? Which effects of problem drinking are reversible? What about relapse? Read about lifestyle changes and the positive side of recovery from alcohol problems.

Minorities

What does the latest research show about the drinking patterns and practices of minority Americans? What is the economic toll exacted? What are the implications for health and prevention? Read what the experts are saying and doing about the drinking practices and problems of Black, Hispanic, Native and Asian Americans.

Next Issue

The idea that servers of alcoholic beverages can be held responsible, in some circumstances, for the actions of intoxicated patrons or guests is not new. But recent court decisions and renewed legislative activity concerning server responsibility — and liability — have made this an important issue spawning social, legal, legislative and educational activity and debate. The special focus section in the summer issue of *Alcohol Health and Research World* is devoted to a timely examination of some of these developments. We'll also feature articles examining the role of genetic factors in alcoholism and a look at the NIAAA Laboratory of Metabolism.

Third Installment of Statistics Series Available

We urge our readers to write us and request a free reprint of the third installment in the series entitled "Statistics in Research Reports: A Reader's Guide." The article, which appeared in the Winter 1985/86 issue of *AH&RW*, was affected by a production error. Write NCALI, P.O. Box 2345, Rockville, MD 20852. Request reprint #543.

Alcohol Health & Research World

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control our drinking when impairment poses dangers. If our drinking becomes a source of pain and embarrassment, then we must recognize that we have a problem, get help, and perhaps stop drinking altogether.

We don't need to be "taught" to drink. None of us "needs" alcohol. It is okay not to drink at all. But we have a serious obligation, if we choose to drink, to monitor the drinking and its effects scrupulously and honestly. All of us must heed and respect alcohol's seductive and addictive properties.

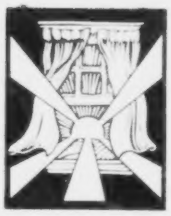
Ronald S. Beitman *is a trial lawyer in Falmouth, MA, and the editor of the* Dram Shop and Alcohol Reporter.

I am frequently confronted by what I would term the "frontier mentality" of liquor licensees, who want to return to those thrilling days of yesteryear when a bar could serve as much alcohol as a customer could consume and still be able to reach into his pocket for the dollar. That attitude, while it may not have resulted in many deaths when travel was predominantly by horse and buggy, is outrageous when applied to the use of motor vehicles in this century. Commercial hosts and social hosts frequently argue that they should not be held liable for serving already-intoxicated persons because they do not have the same experience as a bartender in recognizing visible signs of intoxication and they do not receive any financial benefit from the dispensing of alcohol. While each potential defendant in a liquor liability case has some philosophical or moral reason why he or she should not be held responsible for a drunk-driving accident, the victim of the drunk driver, lying in the roadway, does not have the luxury of such intellectual debate. To the victim of a drunk driver, it is irrelevant whether the drinking took place at a bar, a company picnic, or a housewarming party. The drunk driver is always responsible for the injuries which he or she caused to the victim. Over the past 3-4 years, people in society, and therefore jurors, have become much more aware of the role that bars, restaurants, taverns, commercial hosts, and social hosts can play in preventing drunk-driving accidents on our highways. In response, jurors have expanded the potential responsibility for drunk-driving accidents to these groups.

From my experience as a trial lawyer representing the victims of drunk drivers, the problem does not seem to be the adoption of policies and practices designed to make those who serve alcohol more aware of visible signs of intoxication. Most of my cases involve the serving of blatant amounts of alcohol to a patron who a 6-year-old would have recognized as intoxicated. The problem seems to be the response of those who serve alcohol once they have recognized visible signs of intoxication. A waiter or waitress of college age, working in a seasonal bar for minimum wage plus tips, and the bartender who is earning a salary based upon the percentage of alcohol he or she sells, are in a position to push alcohol. The bartender who is confronted with an intoxicated "regular," more frequently than not, will serve the next drink in order to discourage the patron from making some other establishment in town his or her new watering hole. While I certainly do not discourage the adoption of alcohol-server policies and practices, too often the adoption of such policies and practices by liquor licensees is merely a paperwork exercise for the purpose of having them admitted at the time of trial as evidence of good practices on the part of the defendant establishment or commercial host.

Unquestionably, through the enforcement of criminal drunk driving laws, the institution of fines and suspensions by alcoholic beverage control commissions, and the payment of multimillion-dollar verdicts and settlements, there has been a change in both the nature of the service of alcohol by liquor licensees and the consumption of alcohol by patrons. So long as victims of drunk drivers continue to assert their rights against all those responsible, liquor licensees, employers, and homeowners will be forced to assume responsibility for all of us out on the highways, a responsibility that has been neglected for too long.

John de Miranda, Ed.M., *is the alcohol program consultant for the San Mateo County (CA) Health Services Department.*



In recent years, we in the alcohol problems field have witnessed and welcomed a serious reevaluation of alcohol's role in many aspects of contemporary American life. A "window of opportunity" has opened allowing for significant policy initiatives that will reduce both alcohol consumption and resulting social problems. Several factors have converged to create this opportunity: (1) declining alcohol sales; (2) renewed interest in alcohol problems, especially drinking and driving; and (3) a growing emergence of public opinion that encourages moderation in alcohol consumption.

There is no doubt that, as policymakers, we are at a critical point in the evolution of society's relationship with this troublesome beverage.

The burgeoning responsible-beverage-service (RBS) phenomenon—as evidenced by recent national conferences, the passage in Oregon of mandatory server-training legislation, government funding for server-training research, and moves within the beverage alcohol industry to develop and market their own server-training programs, for example—provides a real opportunity for action. Whether this movement will be a catalyst for fundamental change or just a passing fad depends largely on the ability and willingness of the alcohol field to assume a leadership role in determining the shape and focus of RBS efforts.

Currently, the movement is dominated by alcohol beverage production interests and various entrepreneurs whose commitment to and interest in altering serving practices are motivated by desires to respond to changing consumer taste, to protect profits, to improve their public image, and to limit liability exposure. In my opinion, only a small part of current RBS efforts contain legitimate prevention elements.

Although initially slow in responding to pressure to "clean up their act," the manufacturers have recently been quite active in advancing programs, slogans, and pamphlets to help solve the drunk-driver problem. While these activities appear to the layperson as well intentioned—and do, in fact, move in a positive direction—they fall far short of including messages and practices aimed at actually reducing consumption and the resulting social problems. The stereotyped killer drunk or the sick, individual alcoholic is usually advanced as the sole target of remedial or preventive efforts.

Since profit is inexorably tied to consumption, perhaps it is naive and unrealistic to expect the alcohol-beverage industry to move, voluntarily and aggressively, to curb consumption. Indeed, if the intent of the server programs is to ensure that the least possible harm comes to the public from the abuse of alcohol, a profit- and sales-driven industry should not be the principal designer or content arbiter of such programs. The alcohol-problems field is fast developing the expertise to provide leadership and can perhaps, one day, create a set of standards against which all responsible beverage service programs can be measured. Such standards would, I believe, help guarantee the inclusion of serious prevention components.

Alcohol prevention specialists often have been reluctant to become politically active and to advocate measures designed to limit or lower consumption. Championing such stands often elicits pejorative charges of "neoprohibitionism." Such baiting tactics only serve to increase polarization and confuse the public.

Fortunately, we are beginning to witness the formation of grass roots alliances among restaurants, bars, clubs, and local prevention and public health agencies—alliances that are committed to providing serious, prevention-oriented server intervention training to commercial establishments. This type of local "front lines" program holds the promise of maximizing cooperation and ensuring that today's "window of opportunity" will remain open and allow some fresh air to enter our bars and restaurants.

Robert N. Gilmore, Jr. *is a New York-based insurance consultant. He was formerly senior vice president for legal affairs of the American Insurance Association.*

In the past few years, drunk drivers have become a primary target of State legislatures. Stiff laws punishing convicted drunk drivers have been enacted. The media constantly remind the public that drinking-and-driving is a lethal combination to be avoided at all costs.

The upshot of this public attention has been an intense awareness of this major problem on the part of many concerned groups, including the liquor industry, the hospitality industry, the legal and insurance professions, public interest groups, State and Federal policymakers, and specialists in alcohol problems. Each is seeking to identify its responsibilities in order to make an effective contribution to immunizing the public against the tragedies of driving while intoxicated.

Many years ago the liquor server was not legally responsible for accidents caused by a patron who had been served too much to drink. The courts held that it was the consumption of the alcoholic beverage, and not the sale, that was the proximate cause of the accident. While some States still adhere to the old common-law rule, in many others the law has been changed by the enactment of "dram shop" statutes that make the liquor server liable for drunk-driving accidents following the sale of liquor to intoxicated persons or to minors. Other States have achieved the same end through court decisions changing the old common rule. Despite the fact that liability on the part of liquor servers has been widespread for a number of years, many liquor vendors apparently did not purchase liquor-liability insurance. Very likely they thought the possibility of a claim was remote.

Actually, liquor-liability insurance was not marketed by all insurers. It was not widely sold by large commercial insurers. Sometimes they sold liquor-liability insurance as part of a package policy or as an accommodation to a valued policyholder. If a modest-size restaurant, tavern, or bar-and-grill desired liquor-liability insurance, it turned to a surplus-lines insurer (a nonlicensed insurer permitted under certain circumstances to write insurance not otherwise obtainable) or to specialty companies (which generally are smaller and concentrate on selling policies covering risky operations).

Now, however, dramatic changes are taking place. Motivated by accelerating litigiousness and also propelled by the public's growing concern about drunk drivers, the number of suits and the size of settlements have increased alarmingly. In the face of these developments, most liquor vendors, including those who were uninsured in the past, now want liability insurance. This dramatic upsurge in demand comes at a time when specialty companies and surplus lines insurers have begun to withdraw from the market in the face of mounting losses. The large commercial insurers are striving desperately to extricate themselves from very heavy losses suffered on all commercial liability coverages and are not anxious to venture any farther into the unknown area of dram shop liability.

Against this background, the question presents itself: Can the insurance business be expected to assume part of the responsibility for a policy or program that will make a real contribution to solving the problem? *In the narrow confines of dram shop liability*, the answer is clearly in the negative. Having eschewed dram shop liability insurance over the years, the commercial insurers are not likely to insure this type of risk at a time when its loss potential appears to be considerable and when they are struggling with extraordinary losses on other liability lines. Those surplus-lines insurers and the specialty insurers who are still in the market cannot be expected to do more than try to underwrite the business carefully. They do not have the staffs and other resources to do much more, and the surplus lines companies are not permitted to render on-the-spot loss-prevention services, as they are not licensed in the State where they insure risks.

However, there is an important role for insurers. As major writers of motor-vehicle liability insurance, members of the insurance industry are heavily involved with alcohol abuse. From their own loss experience, they know that many of the most serious motor vehicle accidents are caused by drunk drivers. Through individual company efforts and insurance trade associations, they are striving to make the public aware of the dreadful consequences resulting from driving while intoxicated.

One further observation is in order, as it goes to the heart of responsibility under tort liabilty. The theory of the tort-liability system is that the negligent person is held responsible and must respond in damages. Conversely, the innocent person—namely, one whose conduct (objectively viewed) could not be considered negligent—is not required to pay damages. However, the fact of the matter is that fault has very little to do with whether or not a defendant has to pay; frequently the innocent person (or his or her insurer) pays. At most, fault may be a factor in determining the amount of damages. The "liability system" is now, and has been for years, a means of compensating an accident victim. The overriding thrust is to find a person with assets, usually insurance. The clearly negligent tortfeasor will be held responsible and that is the way it should be. Those who are remotely related to the accident (but not negligent) may be the only parties with insurance, and payments will be made on their behalf. As it operates today, the liability system is impartial: the negligent pay and so do the nonnegligent.

The lesson is to avoid the accident if at all possible.

George A. Hacker *is director for alcohol policies at the Center for Science in the Public Interest, Washington, DC.*

Any discussion of server responsibility must recognize that efforts to alter drinking behavior beneficially are dependent upon the societal environment surrounding alcoholic beverages. Government and the alcoholic beverage industry play important roles in reinforcing and directing social norms. Unfortunately, in my opinion, government and the industry have not yet fully lived up to their responsibilities in promoting lasting and significant changes in the way alcohol is served and consumed by individuals.

Accurate, complete, and persuasive information is a fundamental component necessary to understand and exercise one's responsibilities related to alcohol. Despite the enormous impact that alcohol abuse has on our economic and social well-being, surprisingly little objective information gets through to the public.

For example, unlike all other food and beverage products, it is not required that alcoholic beverage ingredients be listed, and few companies do so voluntarily. Calories are not listed on the labels of alcoholic beverages (except products marketed as "lite"). Beer labels, pursuant to Federal law, don't tell us a thing about the alcohol content of brews. And, while over-the-counter and prescription drug labels routinely recommend the correct dosage and carry warnings of potential side effects and contraindications, alcoholic beverage labels contain nothing about potential adverse reactions, despite the fact that alcohol can sometimes have much more dramatic and lethal effects. This basic consumer and health information ought to be freely available, and both government and the industry should take the necessary steps to see that it is.

What, then, is our education about alcohol, and from what source do we get it? Each year, alcohol companies spend over $1 billion telling us about their products; their messages attempt to create a magical aura for alcoholic beverages. The themes are happiness, beauty, success, and friendships; drinking is portrayed as part of a youthful, active, fun-filled life worth emulating. These are appealing messages indeed.

Occasionally, there are other messages—those that warn of the dangers of drinking-and-driving and that encourage "moderation" and "responsibility." However, the possible negative effect of these messages on sales has caused the alcoholic beverage industry to shift to a new campaign touting the health benefits of moderate drinking.

Given this status quo, servers face a task much like that of the mythical Corinthian king, Sisyphus, who was condemned in Hades to roll a heavy rock up a steep hill, only to have it roll down again. Putting the onus of moderating societal drinking on alcohol servers is not a sufficient approach to curbing alcohol abuse in this Nation.

The time has come for government to take more aggressive leadership to ensure that vital information about alcohol is readily available to consumers. Most importantly, government should act to present a clear and accurate picture of alcohol use. Proposed legislation, such as the Fairness in Alcohol Advertising Act (H.R. 2526), would require equal time for health and safety information on radio and television. Specific messages about alcohol, targeted particularly at high-risk individuals and covering *all* high-risk situations, would help societal attitudes about alcohol evolve in a positive direction.

Federal beer and wine taxes are still at Truman-era levels. In real terms, the tax on liquor, despite an increase in 1985, is still low. Low taxes have helped to reduce the real price of alcoholic beverages, and today beer and wine are often available at soft-drink prices. Low prices, in my view, encourage greater consumption and help establish alcoholic beverages as the routine beverages to drink. Tax increases are long overdue. Higher prices would help reduce server worries and reestablish alcoholic beverages as unique, adult-priced drinks to be nursed, not guzzled.

Those who serve alcohol, *as well as those who use it,* should have the benefit of all these facts. The message in the media, on the bottle, and in its price should be that alcohol—which can be enjoyed by many upon occasion—is a substance to be used with prudence in all circumstances. Until such a comprehensive effort occurs, commercial and social hosts will be severely handicapped in meeting their responsibilities to ensure the least possible harm to the public from alcohol abuse.

Wade H. Hargrove *is a member of the law firm of Tharrington, Smith & Hargrove, Raleigh, NC.*

Legislators, judges, and jurors alike are demanding that the legal responsibility for alcohol abuse be shared by both the server and the user. How to apportion fairly the shared responsibility between the server and the user poses a difficult challenge for policymakers. Nowhere has that difficulty been more apparent than in the effort of the courts and legislatures to fashion a fair and equitable scheme for dram shop liability.

Under most dram shop laws, an establishment may be held liable for the adverse consequences resulting from the service of alcohol to a minor or to an intoxicated person. Liability will be imposed even if the establishment trained its employees thoroughly and specifically instructed them not to serve minors or those who have had too much to drink. Dram shop laws generally make no distinction between establishments that engage in good business practices and those that do not.

Such a liability standard is harsh, but those who advocate it argue that it encourages the owners of establishments, in the long-run, to be more diligent in preventing irresponsible service. But does it?

Establishments complain that if they have otherwise acted responsibly, it is inherently unfair to hold them strictly liable for an employee's mistake in an isolated incident. They complain of being sued in cases where service of the beverage might have taken place months or even years earlier and the employee who served the beverage cannot honestly recall the facts or circumstances surrounding it. They say the legal cards are now stacked against them and that the service of alcohol has been transformed into a game of legal roulette. "You bet your company with every drink you now serve," is how one restaurant owner recently put it.

Escalating jury verdicts against establishments in dram shop cases have been accompanied by a corresponding escalation in dram shop insurance rates. Many establishments are finding it difficult, if not impossible, to obtain dram shop insurance. If insurance cannot be obtained, responsible establishments will eventually abandon the alcohol-service business and leave behind only those that are indifferent to their responsibilities.

How, then, may a reasonable public policy balance be struck? At least one State legislature (in North Carolina) has tried to do it with a dram shop statute that (a) creates a "good business practices" defense, (b) limits the amount of damages that may be recovered against an establishment, and (c) requires dram shop suits to be filed within 1 year of the date the alleged improper service occurred.

Under North Carolina's "good business practices" defense, an establishment that is sued may introduce evidence of how it trained its employees to recognize problem drinkers and minors and the measures it has implemented to police and supervise its employees. It could, for example, show how it has used its own undercover employees to detect unlawful sales. It could show that it had a policy and practice of checking the I.D. of everyone who appeared to be under 25 years of age. In short, the establishment may offer evidence of any practice it is using to try to prevent unlawful sales. The jury can take all that into consideration in deciding whether the establishment was negligent in any specific case.

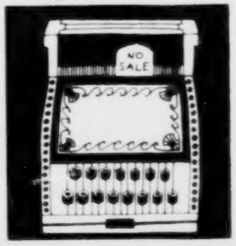
Thus, instead of looking only at how a single employee acted in the single sale that led to the lawsuit, the jury may look at the broader picture of the steps taken by the establishment to see that all its employees act responsibly in all sales of alcoholic beverages. This seems eminently sensible when the *real* issue is whether the establishment—not the specific employee—has acted responsibly. A law that rewards the owners of establishments for responsible behavior encourages responsible behavior.

State legislatures—not the courts—are the best forums for balancing these conflicting public-policy considerations. Courts deal with issues on a piecemeal basis, and rightfully so, because they decide only those issues in front of them. Legislatures can, and usually do, act more comprehensively.

That, in turn, makes the legal risks more predictable; and predictability is the key to a fair and workable dram shop law. No doubt part of the reason for the current soaring rates for dram shop insurance is the unpredictability of the legal risks.

Fair dram shop statutes that strike a proper balance between the conflicting public policy considerations could, in my opinion, go a long way toward assuring reasonable insurance rates for establishments, would give establishments an incentive to act responsibly, and, in the final analysis, would protect the public adequately from those who choose to act irresponsibly.

Louis R. Munch, D.P.E., *is associate professor of health education at Ithaca College, Ithaca, NY.*



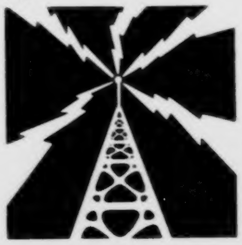
Ten million adults and three million teenagers in America seriously abuse alcohol, and each one of these individuals affects the lives of four to seven other people. We do not have to look far to see the sobering consequences of this alcohol abuse; they are well known and severe. A 1983 report to Congress by the Office of Technology Assessment stated that the cost of alcohol abuse may be as high as $120 billion each year. Another report by the Research Triangle Institute, released in 1984, showed that alcohol abuse costs this nation $116.7 billion annually. The emotional and psychological costs in terms of shattered families and disintegrated lives are beyond measurement.

Any organization or individual that profits from the sale of alcoholic beverages has an obligation to both the consumer and the community. This means that dram shop legislation is appropriate and necessary to discourage server negligence. It also suggests that before a solution can be found, we need to address the basic conflict between public health and corporate profit.

Notwithstanding their educational and highway safety campaigns, the alcoholic beverage manufacturers' primary interest is in the sale of alcohol, and to this end they spend hundreds of millions of dollars on advertising every year. In my opinion, their efforts should instead be directed in support of measures such as raising the drinking age to 21, price controls on alcoholic beverages, State and Federal tax increases, advertisement and marketing controls, restrictions on commercial outlets and hours of sale, warning labels, and ingredient disclosures. In my view, these are precisely what we need if we are ever going to reduce alcohol abuse.

The high cost of alcohol abuse justifies aggressive public-control policies and practices. A concerned public has called for vigorous corrective action. Just as we cannot contain a beast by closing just one of the many doors of its cage, we cannot control alcohol abuse by just education or treatment alone. I believe that the best way to reduce alcohol problems is to reduce alcohol consumption, and the best method to reduce the availability of alcohol immediately is through control measures at both State and Federal levels.

Gerald E. Murphy *is executive director of the National Licensed Beverage Association, headquartered in Alexandria, VA.*



Whenever our society deals with abuses, whether of a product or another human being, we are always eager to find someone to blame and equally eager to ignore the problem of the abuser. This is not to say that some blame does not belong to other individuals in some cases but rather to point out that the best way to put out a fire is to get at its source.

It should be understood that alcoholism is a treatable disease and that individuals who continually abuse alcohol and are incapable of making responsible decisions about its use can be treated successfully. Yet our society seems reluctant to acknowlege these facts. Rather, when intoxicated persons are found on the streets or in automobiles, our solution is to lock them up, throw away the key, fine them, take away their driving privileges, and force them onto our already overcrowded court calendars—and then sue anyone who may in any way have been associated with the persons obtaining the alcohol in the first place. In my opinion, this harsh treatment is a way for our society to deny that this social illness exists.

Our State legislators have been hurrying to pass dram shop legislation in recent years making commercial servers of alcoholic beverages liable for the acts of intoxicated individuals. They act under the misconception that placing this threat over the head of licensed servers will make them more responsible for who and how much they serve. Legislators completely ignore the fact that, by virtue of having licenses to sell alcoholic beverages, servers are already subject under State law to lose those licenses if they serve intoxicated or underage persons. In passing such legislation, most legislators chose to eliminate the social host from the law. Yet, statistics show that only 20 percent of alcoholic beverages is consumed in onpremise establishments, while 80 percent is purchased for offpremise consumption.

The Federal government has passed legislation to pressure the States into setting 21 years as their legal minimum drinking age by withholding a percentage of the Federal highway funds of any State that does not do so. Yet there are no good statistical data, in my opinion, that show that the rate of alcohol-related highway accidents or fatalities drops off to any measurable degree until over the age of 24. Although raising the minimum drinking age to 21 is not the solution to alcohol-related injuries and fatalities among our young people, we are led to believe that total prohibition for the young adult population of this country will solve this problem.

I belabor these points because, whether we want to admit it or not, many of the extreme measures that our society is taking to solve the problem of alcohol abuse are in reality edging us back toward Prohibition—a total disaster in our past history that did nothing to solve the problem of alcohol abuse. It is the responsibility of businesses, commercial and social hosts, government, and abusers themselves to see that alternative policies are pursued.

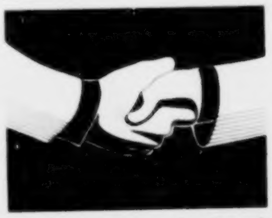
How can these groups and individuals meet this responsibility? In general terms and in the long run, it can be met by education and high public awareness of the alcohol abuse problem.

In more specific terms, abusers should be aware that they are responsible for seeking help. Furthermore, treatment must be available to these individuals, just as treatment for any other illness is available, through medical plans and welfare assistance. Businesses must accept the cost burden of this benefit just as they do that of other medical benefits.

Commercial hosts must take on the responsibility of assuring their customers that they and their employees are trained in the dispensing of alcoholic beverages. They must be able to control not only who is served but also in what quantity alcoholic beverages are served in their establishments, and they must be prepared to discontinue that service when it is not in the best interest of patrons. Social hosts must be aware that overserving alcoholic beverages is as serious a problem as any other act they perform in their homes that may endanger a guest.

Government must safeguard itself from being deceived by "neoprohibitionists" who take advantage of the effort to find a solution to the alcohol abuse problem in order to further their own goals. Government's main responsibility is to establish policies that encourage getting to the source of the problems and promoting the treatment of individuals suffering from this disease.

***R. Carleton Sanford** is the executive vice president of the Maine Restaurant Association, headquartered in Augusta, ME.*



As a result of the work of the Presidential Commission on Drunk Driving and the public's growing and vocal concerns, the hospitality industry has had to assume an increased responsibility to protect the health and safety of the American public. The increasing number of dram shop lawsuits, the diminishing availability of adequate insurance coverage, and changing public attitudes towards the use of alcoholic beverages have forced our industry to reexamine its serving practices.

We used to condone the antics and comedy routines of drunks such as W.C. Fields, and others. However, today's society cannot ignore the statistics: Approximately 25,000 alcohol-related traffic deaths occur in this country each year, at a cost of $24 billion. In addition, an intoxicated pedestrian is three times more likely to be killed in a traffic accident than one who is sober.

I think it is safe to say that the majority of our customers are not there to abuse alcohol; however, that doesn't mean that as an industry we may not have contributed to the overall drunk-driving problem. How does a restaurateur help the consumer to become more responsible for his or her actions? First of all, by being responsible and by reacting positively to the public pressure concerning alcohol abuse. Second, by seizing the opportunity to show the public that, as an industry, we are prepared to work with members of the public, State and Federal governments, and other institutions to help resolve the tragedies resulting from drunk driving. Third, in making our goal the responsible consumption of alcohol, not only do we have to train and educate our managers, bartenders, and other staff, but we need to educate our customers as well.

Some restaurateurs have objected, "Why should I want to cut my beverage sales?" they ask. The best and most obvious reason is that customers are the backbone of the hospitality industry only so long as they are alive.

Another reason is that responsible demand for alcohol remains fairly constant. Promotions that utilize "two-for-ones" and "all you can drink" take in half their sales from alcoholic beverages at a high risk and are fast becoming socially unacceptable. Those that do not lure customers by rapid-consumption promotions typically maintain a steady ratio of food to beverage sales—and generally with very few alcohol-related problems.

Recently, the newly formed Coalition for Dram Shop Reform—consisting of the Maine Restaurant Association, the Maine Innkeepers Association, the Maine Chamber of Business and Commerce, the Maine Grocers Association, the Maine Merchants Association, the Maine Beer and Wine Wholesalers, and the Ski Maine Association—testified before the State legislature's joint standing committee on legal affairs. Our message was clear. "We are facing a crisis that poses a serious threat to our industry, to individual businesses, and—on a personal level—to our employees and their families. This coalition of servers is dedicated to alcohol awareness and server education programs. It supports strong drunk-driving laws and consistent enforcement of State liquor laws and asks the committee for help in establishing new initiatives to reduce drink driving, to apportion more fairly the responsibility for drunk-driving accidents, and to take commonsense steps to improve the insurance climate."

We are gratified by the concerned involvement of various departments of the State government, including the Bureau of Vocational Education, the Office of Alcohol and Drug Abuse Prevention, the Department of Public Safety, and the Bureau of Insurance. The key to this cooperation is a shared concern to protect the $800-million-per-year tourist industry in Maine. Maine is "Vacation Land," where the traditions and sociability of drinking alcoholic beverages are an accepted way of life. Eight hundred million dollars involves a lot of consumers.

There are grave problems to be faced. For example, I believe the insurance crisis probably will get worse before it gets better. Liquor liability insurance is available in Maine—if the restaurant can afford it. If the restaurateur chooses to go "bare," he or she takes a calculated risk in the event of a lawsuit. Some restaurateurs may decide to discontinue alcohol sales; but without additional income to offset the bar profit, this could be difficult.

No doubt this is discouraging to many of our restaurateurs, but it is also an opportunity to respond positively. It doesn't necessarily mean the phasing out of liquor service. It could instead be the beginning of a whole new style of drinking. I recently spent a week in Switzerland where I felt proud to be a part of the food service industry for many reasons. Their spirit of service was strong, but also very noticeable was the lack of alcohol abusers. I saw only one "visibly intoxicated" person. Yet you can't walk a block in a city without passing a cafe where you see families, single people, and businessmen and businesswomen all enjoying their favorite beverages, from a child drinking a cup of milk to others sipping glasses of wine or me quaffing a delicious Swiss beer. The cafes serve little food except for pastries and cakes. I believe this shows that it is possible to establish a tradition of responsible alcohol consumption that does not corrupt the atmosphere of relaxation and conviviality that consumers seek in public eating places.

Our industry has survived up to now and has always been rich in resources. I believe it is equal to the challenge of encouraging a change in drinking habits through a consistent pattern of public education along with improved serving practices.

Each State must face up to the problem of getting the drunk driver off the road. The only way of achieving this, in my judgment, is by utilizing all the resources available for solving the problem. In Maine, I believe the creation of the Coalition for Dram Shop Reform and the response of our legislature and State agencies have given us that opportunitity.

Donald E. Schaet *is executive director of Mothers Against Drunk Driving, headquartered in Hurst, TX.*

Drunk driving in America: Whose responsibility is it? The statistics of this ongoing national tragedy are well known. But we can become inured to the numbers, and it is appropriate to look at the problem personally. Empathize for a moment with one family, perhaps one you know, that has been affected by drunk driving. Physical pain and suffering, deep emotional stress, shock, anger, sheer frustration with senseless and uncontrollable loss, destroyed family life, never-ending grief spasms—all are commonplace.

Collectively, we—individuals, institutions, and enterprises—are responsible for this pain because we have allowed drinking-and-driving to become socially acceptable. Aware now of the tragic consequences, we clearly have the responsibility for remedying the situation.

First and foremost, responsibility lies with the intoxicated individual who drives. The notion that an alcohol-related crash is an *accident* is bogus. It is a consequence of irresponsible behavior, something that was foreseeable. It is OK to drink if you choose, but it is not OK to drink and then drive; personal rights must yield to public safety.

Ideally a drinker should exercise responsibility and avoid getting into a situation of being apt to drive while intoxicated. This means knowing your limits, drinking moderately, eating while drinking, and stopping well before it is time to drive home. It also means planning ahead, to make sure you are with friends who care enough to stop you; to be well rested before drinking; and always to plan a viable alternative to drinking-and-driving, such as staying overnight, taking public transportration, or asking someone else to give you a safe ride. Individuals must think *before* they drink. They may not be capable of thinking rationally when it's time to drive.

Secondly, social and commercial hosts must *think* before they serve. They have a responsibility to do so, not only because of third-party liability laws and judgments but also because it is uncivilized to aid and abet the commission of the crime of drunk driving.

Social hosts can follow the "Eats, Drinks, and Be Waries" guidelines recently published in a newspaper supplement by Northwest Media to bolster drunk-driving awareness in Oregon, the leading antidrunk-driving State. Eats: serve food with alcohol; serve high-protein and low-salt foods; and serve dinner early—doing so slows the effects of drinking. Drinks: have nonalcoholic drinks and create a climate for their use; use a bartender who will not be too generous; use noncarbonated mixers; push fun, not drinks. Be wary: stop serving alcohol an hour before the party ends; offer a late-night snack; keep an eye on a guest who is drinking too much; have a bed ready; and be prepared to step in and prevent a guest from driving.

Many of the same concepts apply for commercial hosts. Like it or not, they have a responsibility to prevent drunk driving. Thirty-eight States have some form of "dram shop" law that says so. Commercial hosts can and should establish beverage-service policies and practices that discourage intoxication in patrons. Commercial hosts also need a plan to prevent intoxicated persons from driving and a commitment to carry it out even if it may mean the loss of a future sale.

Thirdly, what about the responsibility of other businesses? Since we spend a third of every 24 hours at work, the potential for influence there is powerful. Alcohol-related accidents (all types) cost business billions of dollars a year. Therefore, it is not only good corporate civic behavior to exercise responsibility regarding alcohol use, it is also good business. Every corporation should have a company safety policy, an employee drunk-driving prevention program, and an employee alcohol-awareness program—

not to mention ensuring that alcohol is not misused at office parties and company picnics. Customers on the premises who obviously have been drinking and driving should be reported to the police. Alcoholic behavior by employees should not be tolerated.

Anathema to many in our land—where individual liberty is so highly valued—is more government control. Yet the government does have a heavy responsibility to prevent drunk driving. Certainly as strong a case can be made for protecting the citizens from drunk drivers as from others who intrude on our rights, such as jaywalkers, speeders, and those who might take weapons on airplanes. Yet such commonsense ideas as not allowing people to drink *while* driving (i.e., open-container laws), administratively revoking an offender's license, curtailing drinking by young people, designing unalterable drivers' licenses, using safety checkpoints, requiring strong punishment for repeat offenders, and assuring rights for victims that are equal to those of defendants have not yet been universally enacted into law. Youth education programs that teach kids how to say "no" to drinking and driving, aids to enforcement, and fair judicial treatment by courts also get short shrift when it boils down to priorities. Yes, government at all levels has a big responsibility to make our roadways safer, and the sooner action is taken, the sooner the carnage on the highways will stop.

In summary, the challenge is twofold: (1) to curtail drunk driving immediately and (2) to foster a change in the attitudes of Americans that will cause an enduring behavioral change. Each of us is responsible for not drinking-and-driving. But it will take the combined exercise of responsibility by all elements of society—especially social and commercial hosts, businesses, and government—to create a milieu in which drinking-and-driving can no longer flourish.

***Robert I. Simpson** is a health promotion consultant to the division of community services of the Addiction Research Foundation in Toronto, Ontario, Canada. He is also assistant clinical professor in the faculty of health sciences at McMaster University in Hamilton, Ontario.*

It is generally accepted that the issue of server responsibility is framed within the context of ensuring that the least possible harm will come to the public from the abuse of alcohol. Not often specified, however, are the particular forms of "alcohol abuse" that are of concern. Yet, without this information, it is difficult, if not impossible, to identify how we might go about ensuring that the least possible harm will be done.

Two forms of alcohol abuse in particular are relevant to server responsibility: drinking to intoxication and drinking-and-driving. Populations with high prevalence rates for these "risk drinking behaviors" will have predictably elevated rates for a variety of alcohol problems. Consequently, ensuring that the least possible harm will come to the public becomes integrally linked to lowering the frequency of these drinking behaviors.

Drinking to intoxication is most easily defined in terms of the blood alcohol concentration (BAC) of the drinker. Many States equate it to the legal driving limit—usually .10 percent. The Canadian driving limit is .08 percent and would constitute a much safer threshold for intoxication, from the perspective of preventing alcohol problems.

With respect to drinking-and-driving, there is convincing evidence that no driver should be on the road with a BAC over .05 percent, as the risk of collision increases significantly beyond this level. Ideally, people with any BAC at all should not be driving.

In order to reduce the prevalence of these key risk behaviors, two principal strategies can be defined:

1. Drinking environments should be designed to minimize the incidence of drinking to intoxication and to prevent drinking-and-driving (controls on supply).
2. Drinkers should choose to avoid drinking to intoxication and drinking-and-driving (moderation of demand).

These strategies have major implications for producers, commercial hosts, governments, and drinkers themselves.

Producers find themselves in an uncomfortable position if they wish to conform with these strategies. Essentially, they have to separate their financial growth from increased sales of alcohol, which are inextricably linked to higher rates for the targeted drinking behaviors. They face two options: (1) Diversify product lines so that profits are dependent on something other than harmful drinking practices, and (2) effect the substitution of low-alcohol products for their regular alcohol counterparts.

While the first option is self-explanatory, the latter may benefit from illustration. It would involve convincing consumers to substitute, for example, a beer containing 2.5 percent alcohol by volume for one containing 5 percent. While halving the consumption of alcohol, profits would be maintained, the customer would still enjoy a drink, and public health interests would be met. Clearly, the product would have to be acceptable in taste, and innovative marketing programs would have to be used to persuade drinkers that the substitution would be in their best interests. Meeting both conditions would require the full resourcefulness and creativity of the industry.

Commercial hosts are central to the concept of server responsibility. They account for a significant proportion of both alcohol sales (almost 20 percent in Ontario) and impaired drivers. In one large-scale study, it was found that 35 percent of Ontario patrons who drove away from licensed establishments had BACs over .05 percent.

The commercial host can exercise a notable degree of control over the drinking environment so that it discourages harmful drinking practices. This suggests that clear impediments should be present to prevent patrons from consuming more than five drinks, from attaining BACs greater than .08 percent, and from driving away with BACs greater than .05 percent.

To meet this expectation, commercial hosts should adopt a set of operating policies that support these "low risk" limits. In addition, all serving staff should be trained to influence patrons' consumption effectively so that the risk thresholds are not crossed. Increasingly, examples of effective policies and training programs are emerging across North America. Moreover, many commercial

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College Alcohol Survey

1985, 1982, and 1979

David S. Anderson, Ph.D.
Angelo F. Gadaleto, Ph.D.

The College Alcohol Survey, initiated in 1979 and repeated in 1982 and 1985, was developed to gain an accurate assessment of collegiate policies and activities regarding alcohol use and abuse over time. As noted in a report on the earlier surveys (Anderson and Gadaleto 1984), the attention devoted to these matters by college and university administrative personnel has intensified in recent years, prompted by survey data suggesting widespread alcohol problems among students. The 1985 survey was carried out to elucidate further the apparent trends in institutional perceptions of alcohol problems and the responses to them.

The survey questionnaire was sent to the chief student affairs administrators in a quasi-representative sample of 330 4-year colleges and universities nationwide (approximately 10 percent of all U.S. colleges and universities). Institutions were selected from all 50 States and the District of Columbia; where possible, seven institutions were selected from each jurisdiction. In making the selections, a balance was also sought with respect to public or private status, enrollment size, and setting (see Table 1). The same sample was used in all three surveys, although response rates varied (50 percent in 1979, 71.5 percent in 1982, and 61 percent in 1985). Despite the fluctuating response rate, generally only insignificant differences in the group characteristics of the responding institutions were found. Questions in the College Alcohol Survey were designed to collect information on four distinct areas of interest: (1) campus alcohol policies, (2) institutional perceptions of alcohol problems on campus, (3) treatment and referral services, and (4) prevention and education activities.

Alcohol Policies

Although there have been no significant changes since 1979 in the proportion of colleges and universities that permit the consumption of beer (78 percent in 1985) and hard liquor (69 percent in 1985) on their campuses, the conditions under which alcohol use is permitted have changed. For example, prior registration for oncampus group activity at which alcoholic beverages are to be consumed is now required at nearly one-half of the institutions. In addition, 86 percent of colleges (compared with 54 percent in 1979) now require that an alternative (nonalcoholic) beverage be served at all public functions at which alcohol is served. The requirement of concurrent food availability has also spread significantly: 71 percent of surveyed campuses now require such service, compared with 24 percent in 1979 and 46 percent in 1982.

Advertising standards have also become more stringent, with only 13 percent of college campuses now permitting alcohol to be advertised as the primary focus of an event. This is a significant decline from the comparable figures for 1979 and 1982 (49 percent and 23 percent, respectively). Similarly, significantly fewer campuses now allow the advertising of an event to mention the availability of alcohol (54 percent in 1985 versus 66 percent in 1979). However, offcampus establishments that depend primarily on the sale of alcoholic beverages (e.g., bars, pubs, lounges) are permitted to advertise on 80 percent of the campuses. Among institutions that allow the advertising in campus newspapers of alcohol-related activities, one-quarter prohibit the advertising of "happy hours."

Table 1 Characteristics of Institutions Responding to Three College Surveys

Survey	Status		Enrollment			Setting		
	Public	Private	4,000 or Fewer	4,001 to 10,000	10,001 or More	Urban	Suburban	Rural
1985	58	42	33	21	46	42	25	34
1982	61	39	43	33	24	39	35	26
1979	59	41	37	27	36	46	21	33

Note: All figures are percentages. Using a z test for differences between uncorrelated proportions, the only significant difference occurred in the enrollment category of "10,001 or more" between 1982 and 1985.

University of Virginia

Institutional/Administrative Data

The use of formal assessments of student alcohol-related knowledge and behavior has not changed for our sample during the 6-year research period. Of the 1985 respondents, 44 percent had surveyed students' drinking behavior and attitudes, while about one-third of the campuses report having probed students' knowledge about drinking.

The 1985 results suggest that administrators believe that alcohol use or abuse is a major factor in problem behaviors on campus. Table 2 shows the extent to which surveyed administrators thought alcohol was involved in each of several problem categories.

Administrators perceive significant changes over time in the frequency of alcohol-related problems on campus. In 1979, 54 percent believed that such problems had increased during the previous several years; this rate dropped to 42 percent in 1982 and 30 percent in 1985. Conversely, only 7 percent in 1979 believed that alcohol-related problems had decreased during previous years. This view was held by 20 percent in 1982 and by 28 percent in 1985.

With regard to the desired minimum drinking age, 55 percent of the respondents preferred an age of 21 years or above. A minimum drinking age of 21 is believed by 46 percent of administrators to decrease the frequency of student drinking, as well as to decrease drunk driving (52 percent). Approximately one-fourth of administrators believe that this drinking age leads to greater student use of marijuana and other drugs; however, nearly three-fourths believe that there is no effect. The majority believe that a minimum drinking age of 21 does cause not only a higher incidence of student drinking in uncontrolled settings but also the use of false IDs to purchase alcohol. Nearly one-third of administrators believe that it increases retention of students as well as academic success. Over one-half believe it has no effect.

Treatment and Referral Services

A variety of resources is now available on college campuses to assist students and employees with alcohol-related problems. Although many of these services were quite extensive at the time of the 1979 survey, some recent changes are noteworthy:

Virtually all college campuses provide assistance to students with drinking problems at counseling or health centers. By 1985, 86 percent of the surveyed institutions reported making referrals to offcampus drug treatment facilities.

The proportion of campuses offering group counseling for problem-drinking students increased significantly, from 36 percent in 1982 to 60 percent in 1985. A similar trend can be seen with support groups for students whose lives are being negatively affected by an alcoholic: Such groups existed at 53 percent of campuses in 1985, up from 21 percent in 1979 and 39 percent in 1982. Employee assistance programs are available on one-third of campuses nationwide, with no significant change reported since 1982. Training of paraprofessional staff to deal with students with drinking problems is reported on two-thirds of the campuses, with no significant changes noted during the 6-year survey period.

Table 2 Estimates by College Administrators of the Extent of Alcohol Involvement in Selected Oncampus Problems (1985 Survey)

Problem	Mean (%)	Median (%)
Damage in residence halls	61	70
Damage to other property on campus	53	50
Violation of campus policies	51	50
Violent behavior	60	75
Physical injury	44	45
Emotional difficulty	34	30
Lack of academic success	29	25
Student attrition	21	15

A new question added to the 1985 survey asked how the factor of alcohol involvement in infractions of the rules affected the sanction applied. Thirty-one percent of surveyed campuses reported that the sanctions are more severe if alcohol is involved. No institutions reported less severe sanctions in such cases. More than one-half of all campuses require some form of alcohol education in cases involving alcohol.

Prevention and Education

The general trend throughout this sample of college campuses is for greater attention to be given to the issue of alcohol use and abuse. Not only is a wider variety of professional staff involved in these efforts, but also virtually every type of educational resource is being used more frequently or is more widely available.

In 1979, 69 percent of college campuses conducted some sort of alcohol education and prevention program. This proportion rose significantly to 79 percent in 1982 and to 88 percent in 1985. Nearly two-thirds of the campuses have a task force or committee that focuses on alcohol education and abuse prevention, a significant increase from the 37 percent with such a group in 1979. Leadership in initiating programming continues to broaden; most organizations or offices capable of providing such leadership—including deans of students, residence life offices, counseling centers, health centers, and fraternities and sororities—are more likely to do so now than in earlier survey years.

A most noteworthy change is that nearly one-half of all campuses currently designate an individual to serve as Alcohol Education Coordinator/Specialist. This is a significant increase from the 14 percent of institutions reporting such a staff function in 1979. Funds are specifically designated for alcohol education programming on 43 percent of the campuses, up significantly from 28 percent in 1979.

Major changes were found in the nature of educational activities offered on the campuses. Nearly two-thirds of the campuses have speakers, films, workshops, and campus newspaper articles. One-half have discussion groups and educational handouts prepared by campus groups, and they address the

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Liability Lawsuits
Prevention Steps for Colleges and Universities

In 1983, at the University of Denver, an intoxicated student was injured in a trampoline accident at an offcampus fraternity house. The university was sued and was ordered to pay the student $7.3 million in damages. An appeal ruling reduced the award to approximately $4 million.

In an earlier incident (1979), a Delaware Valley College student sued after he was paralyzed in a drunk-driving accident on the way home from an offcampus sophomore class picnic. The sophomore class advisor (a faculty member) had helped to plan the picnic and had disbursed funds to purchase beer for the event, despite the fact that Pennsylvania's legal drinking age is 21 years and most college sophomores are 19 years old. The court found the driver of the car, the college, the town of Doyleston, the beer distributor, and the class advisor all liable for total damages of $1.1 million. However, a Federal court later modified the award and only the beer distributor, the town, and the driver of the car in which the claimant was a passenger were ordered to pay reduced damages.

Over the past 5 years, college administrators have become increasingly concerned about protecting their institutions against such alcohol-related law suits, a task complicated in many States by recent changes in the minimum drinking age. Dennis R. Black, J.D., a practicing attorney and associate dean of student affairs at the State University of New York at Buffalo, conducts seminars around the country on alcohol-related legal issues for colleges. Black advises that, while no single act can guarantee protection, administrators would do well to consider the following precautions against liability actions:

- Take all reasonable steps to enforce existing alcohol distribution and consumption regulations, including checking for proper age identification.
- Provide all campus alcohol servers with adequate training to assist in the identification and handling of intoxicated persons.
- Ensure that nonalcoholic beverages are as readily available as alcoholic drinks at campus events and are displayed with equal prominence.
- Make sure that plenty of food is available where alcohol is served, especially protein-rich items such as cheese, crackers, and pizza, which slow the rate of alcohol absorption into the bloodstream.
- Develop alcohol-free events, such as dance marathons, dorm campouts, casino nights, sports competitions, and "mocktail" parties to take the place of traditionally alcohol-related activities.
- Eliminate "happy hours," discount prices, keg parties, and other practices that encourage the consumption of alcohol.
- Stop the service of alcohol an hour prior to the expected conclusion of any event.
- Establish an alcohol-problem awareness group on campus to educate students on responsible drinking.
- Restrict to appropriate levels the amount and kinds of alcohol served, according to the type of event, participants, and duration of the activity.
- Post notices stating the legal drinking age at the entrance and in beverage serving areas of campus functions where alcohol is served.
- Avoid open bars by requiring all campus alcohol service events to be attended by a responsible server at all times.
- Provide due warning to the campus community on the health and safety hazards of alcohol abuse through educational and informational activities such as health fairs, panel discussions, demonstrations, film festivals, and a dedicated alcohol-problem awareness day or week.
- Establish a designated-driver program, allowing the driver for a group to drink nonalcoholic beverages free of charge in order to eliminate the risk of drunk-driving incidents.
- Take steps to ensure that the campus health services, the counseling center, and the disciplinary systems are sensitive to alcohol-related problems and are prepared to inform and intervene.
- Maintain adequate liquor-liability insurance.

Black noted that these precautionary measures can be seen as an extension of the basic concern colleges and universities traditionally have expressed for the personal health and safety of students. In view of alcohol-related judgments that may seem staggering, Black encourages implementation of these measures as a means of preventing damages, both personal and monetary. ■

—Gina Burney, NCALI

For further information, contact Dennis R. Black, J.D., Division of Student Affairs, SUNY-Buffalo, 542 Capen Hall, Buffalo, NY 14260.

Activity Ideas for College Campuses

To assist administrators who are responsible for formulating policies and programs concerning the use of alcohol on their campuses, the National Clearinghouse for Alcohol Information (NCALI) has developed the *Update: Activity Sampler for College Prevention Programs*. This new 3-page publication describes 15 activity ideas that can be implemented easily on most campuses. Ideas range from establishing alcohol-free dorms to setting up student assistance programs and wellness centers. ■

For a free copy of the *Activity Sampler (MS314), write NCALI, P.O. Box 2345, Rockville, MD 20852 or call (301) 468-2600.*

NIAAA Intramural Studies in Metabolism

Explorers Along the Metabolic Pathway

DOUG M. PODOLSKY

It is a widely held belief that because alcoholism involves the behavior of drinking excessive amounts of ethanol, the key to understanding the disease must lie within the brain," says Richard L. Veech, M.D., chief of the NIAAA Laboratory of Metabolism in Rockville, Maryland. "To the extent that any volitional act requires brain function, such a proposition is undeniable."

However, Dr. Veech quickly points out, there are numerous examples of stereotyped aberrant behaviors that are now understood to be the result of a generalized *metabolic* effect. For example, the self-mutilatory behavior characteristic of Lesch-Nyhan syndrome results from a generalized deficiency of the enzyme necessary for purine metabolism. It is not understood, however, how such an enzyme defect with its resultant metabolic abnormalities expresses itself in such bizarre behavior.

For alcoholics and nonalcoholics alike, the ingestion of alcohol affects nearly all of the body's major metabolic pathways, from those dealing with the oxidation of carbohydrates, fats, and proteins to those that facilitate the formation of ATP (the powerhouse that runs the chemical machinery of the cell). However, the precise point at which the metabolic changes induced by the ingestion of alcohol become pathologic is not known and, indeed, may not be the same for all individuals.

For alcoholics and nonalcoholics alike, the ingestion of alcohol affects nearly all of the body's major metabolic pathways.

How Ethanol is Metabolized

"What is known about the metabolism of alcohol suggests that, for most humans, the process is among the simplest of any commonly ingested substance," says Dr. Veech. The initial step of alcohol metabolism occurs in the enzyme matrix of the cells of the liver. It is there, Dr. Veech explains, in the portion of the liver cell called cytosol, that alcohol is first converted to acetaldehyde by the action of the enzyme called alcohol dehydrogenase. In the second step, the bulk of the acetaldehyde is converted to acetate by the enzyme aldehyde dehydrogenase. This occurs within the liver cells' sausage-shaped organelles called mitochondria. The acetate formed by this second reaction leaves the liver cell for extrahepatic destinations in body tissue. It is subsequently metabolized to acetylcoenzyme-A and via the Krebs Cycle to carbon dioxide and water.

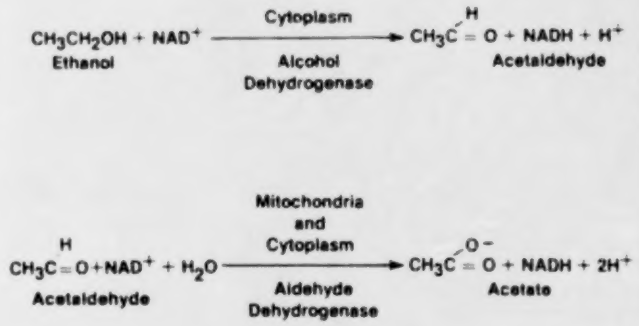
Under conditions where acetaldehyde metabolism is blocked, compounds such as acetoin can be produced by the brain following ethanol administration, thus robbing the brain of the energy it would normally derive from the metabolism of glucose, its major fuel.

A great deal of the alcoholism literature has focused upon acetaldehyde, one of the chief metabolites of alcohol. A survey of the literature has shown that researchers have developed three major hypotheses concerning the possible role of acetaldehyde in alcoholism. Specifically, investigators have hypothesized possible effects of acetaldehyde in:

- altering the way nerve signals are transmitted in the brain (Davis and Walsh 1970);
- causing the formation of opiate or enkephalin-type molecules in the brain, which in turn may cause the exposed animal to consume more alcohol and lead to the formation of the biochemical link in alcoholism (Myers and Melchior 1977); and
- as a genetic marker for alcoholism (Schuckit and Rayes 1979).

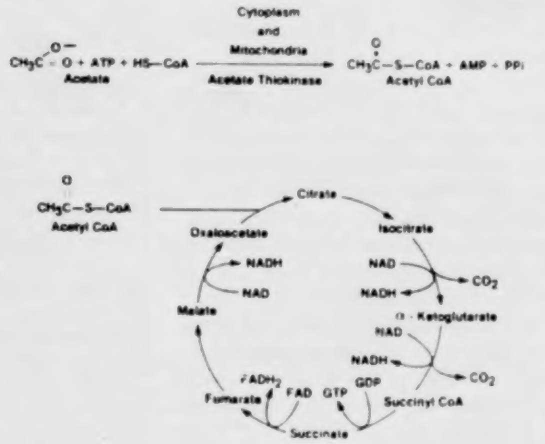
In contrast to acetaldehyde, relatively little attention has been paid to the effects of acetate, the product of acetaldehyde metabolism. However, in investigations conducted at the NIAAA Intramural Laboratory of Metabolism (LM), it has been shown that the metabolism of acetate has multiple effects upon the major metabolic pathways of the body such as gluconeogenesis, purine and pyrimidine synthesis, DNA and RNA metabolism, genetic expression, and metabolism of minerals— particularly calcium Ca^{2+}), phosphate, and inorganic pyrophosphate (PPi) (Veech et al. in press).

In studying these various pathways, LM researchers have developed a series of new analytic methods, including techniques for measuring mitochondrial contents and nucleotides in animal tissue and the first practical method for measuring PPi in tissue or body fluids. "One remarkable finding that arose from



Pathway of ethanol oxidation in liver.

Source: Richard L. Veech et al. 1981.



Extrahepatic metabolism of acetate produced from ethanol.

such studies was that the 2 to 4 mM of PPi known to accumulate in the mitochondrial matrix during acetate metabolism cannot be detected using sophisticated magnetic resonance imaging techniques even though this amount is well within the sensitivity of the instrument to detect," says Dr. Veech. "This finding, therefore, has far-reaching implications for the understanding of the fundamental nature of the environment within the mitochondrial matrix." In itself, the evaluation of PPi to 2 to 4 mM levels during acetate metabolism raises fundamental questions in a number of areas. For instance, the elevation of liver glucose and, hence, blood glucose by the cytoplasmic generation of PPi suggests the importance of this cofactor not only as a regulator of glucose, but as a previously unconsidered factor in diabetes.

Elevation of intracellular PPi exerts the largest and most rapid changes yet observed upon cellular calcium contents. Intracellular Ca^{2+} is the major cellular regulator of a multiplicity of reactions, from hormone actions of all sorts to malignant transformation by oncogenes.

LM investigators are currently examining the relation of PPi to a number of fundamental metabolic syntheses including glucose, protein, nucleic acids, and urea. "These will be examined from a basic science point of view as well as from the point of view of abnormalities induced by the presence of acetate in the alcoholic," Dr. Veech says.

For instance, acetate's effects are likely to play a role in the painful and disabling effects of osteoporosis, a bone disease characterized by brittleness and deformities associated with loss of calcium from the bones. "Osteoporosis, a common condition that affects the elderly female population, also to a greater extent afflicts alcoholics," according to Dr. Veech (Mezey et al. 1979; Saville 1965).

The Effects of Ethanol on Lipid and Nitrogen Metabolism

Abnormalities in the metabolism of lipids (fatty substances in living cells) are central to the classic toxicities of alcohol ingestion. Such abnormalities are associated with liver diseases—perhaps the best-known medical complications of alcoholism. Specifically, these are the following:

- Fatty infiltration—occurs in nonalcoholics given acute exposure to excessive amounts of alcohol over 2 to 3 days
- Alcoholic hepatitis—includes both fatty and inflammatory changes
- Cirrhosis—involves replacement of masses of hepatic tissue with fibrous tissue
- Acute yellow atrophy—an acute disease with fatty infiltration, inflammatory changes and death of hepatic cells following consumption of up to one quart of distilled spirits per day for several months.

Less well known, but possibly more devastating, are the effects of ethanol metabolism on the pathways of protein and nucleic acid metabolism. Ethanol metabolism not only decreases urinary excretion of uric acid by the kidneys, it also increases the hepatic production of uric acid. Uric acid is the end product of the metabolism of purine bases which include constituents of nucleic acids. Investigators in the Laboratory of Metabolism have sought the precise mechanism of ethanol's effects upon the pathway of purine and pyrimidine synthesis, and their further conversion to deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).

Alcoholism: A Collection of Diseases

"Alcoholism is almost certainly a collection of diseases with similar symptomatology," Dr. Veech says. "Its diagnosis is therefore difficult and often is made only after the appearance of a major sequelae associated with the disease. Therefore, any diagnostic tool which could aid in the diagnosis of alcoholism or any indication of the etiology of the disease would be a great aid in the treatment of alcoholism."

Numerous investigators have studied the kinetic properties of alcohol dehydrogenase, the enzyme that limits the rate of ethanol oxidation, to determine if there are differences in the observed rates of ethanol oxidation in alcoholics and nonalcoholics (Mendelson et al. 1965). Such differences would suggest a long-sought genetic basis or a marker for the disease of alcoholism. Although there is considerable variation in the rate at which humans metabolize ethanol, these studies have indicated that there is no significant difference in the rate at which alcoholics and nonalcoholics metabolize ethanol.

Similar studies have been conducted to determine whether there are any differences in the kinetic properties and liver levels of the enzyme aldehyde dehydrogenase (which also would affect the rate at which ethanol is oxidized) between alcoholics and nonalcoholics. They also have failed to show any consistent difference between isozyme patterns (normal variants of these enzymes) for either alcohol dehydrogenase or aldehyde dehydrogenase between alcoholics and nonalcoholics (Tipton et al. 1983).

Therefore, the metabolic expression of the suspected genetic difference between alcoholics and nonalcoholics seems likely to be found in the more subtle aspects of ethanol metabolism. It is these subtle differences that investigators at the NIAAA Intramural Laboratory of Metabolism pursue along charted and uncharted metabolic pathways.

The Identification of 2,3-Butanediol and 1,2-Propanediol in Alcoholics

The discovery by LM investigators of what appears to be different and, perhaps, more complex pathways of ethanol metabolism in severely alcoholic males has opened up an entirely new line of investigation into the biochemistry of alcoholism. "It began when a concerned parent brought to our attention abnormal blood test results from his alcoholic son," recalls Joseph P. Casazza, Ph.D., a research chemist at the LM. "The test results indicated that measurements of the son's blood alcohol concentration (BAC) differed depending upon whether enzymatic or chromatographic methods were used. Because these two methods of determining BACs usually agree, these data suggested that the son's blood may contain an unusual product of alcohol metabolism—an aberrant metabolite."

Further investigation in collaboration with the Tott's Gap Medical Research Foundation in Bangor, PA, indicated that blood samples drawn from 50 intoxicated male alcoholics all contained significant amounts of the same two unusual metabolites called 2,3-butanediol and 1,2-propanediol. Samples taken from 12 intoxicated nonalcoholic controls showed no traces of the substances (Felver et al. 1980).

These findings were further sustained in a later study done in collaboration with the Centers for Disease Control and the Harvard School of Public Health (Rutstein et al. 1983). In this study, 79 percent of the 19 serum samples obtained from intoxicated alcoholics contained measurable amounts of 2,3-butanediol. In addition, all of the samples from the alcoholic group contained 1,2-propanediol. Only one sample obtained from a control group composed of 22 subjects who had been drinking spirits contained 2,3-butanediol. Ten of these samples contained 1,2-propanediol, but in markedly lower amounts than were found in alcoholics.

The metabolic expression of the suspected genetic difference between alcoholics and nonalcoholics seems likely to be found in the more subtle aspects of ethanol metabolism.

Although 1,2-propanediol has been observed in fasting humans and humans in ketoacidosis, 2,3-butanediol has only been observed in alcoholics in the 6 years since the discovery of these compounds in humans. The development of techniques for the analysis of enzymes and metabolites that are thought to play a role in the production of 1,2-propanediol and 2,3-butanediol is playing an important role in the further study of these compounds.

Laboratory Models for the Production of 2,3-Butanediol and 1,2-Propanediol

Two laboratory protocols have now been devised that result in the production of 2,3-butanediol. Administration of ethanol to rats given an inhibitor of aldehyde dehydrogenase has been shown to result in the production of 2,3-butanediol (Veech et al. 1981). This treatment results in extremely high levels of blood acetaldehyde (200 nmol/ml in the portal vein). At these concentrations, acetaldehyde apparently adds to a reactive intermediate of pyruvate dehydrogenase, an important enzyme of oxidative metabolism. This reaction in turn results in the production of acetoin, an immediate precursor of 2,3-butanediol.

Over time, administration of acetone (a metabolite identified in humans during fasting and ketoacidosis) to laboratory animals results in the induction of a metabolic pathway capable of converting the products of fatty acid degradation to glucose (Casazza et al. 1984; Owen et al. 1982; Reichard et al. 1979). In these animals, 1,2-propanediol (a key metabolite of this pathway) has been identified along with 2,3-butanediol. However, the actual mechanism of production of 2,3-butanediol in these animals has not yet been identified. In other animal studies, chronic ethanol administration has been found to result in the induction of this alternate pathway of ethanol metabolism and the transient production of 1,2-propanediol—but not 2,3-butanediol (Casazza and Veech 1985; Koop et al. 1985). Casazza and colleagues (in press) have studied blood samples obtained from a monkey colony maintained on a high ethanol diet for 5 years. The investigators found no detectable 2,3-butanediol in the blood, suggesting that chronic exposure to ethanol alone is not enough to result in the production of this diol (Casazza et al. in press). Still, the relevance of these animal models to the production of 2,3-butanediol and 1,2-propanediol in alcoholics is as yet unclear.

In order to assess whether similar pathways might also operate in humans, investigators from the Laboratory of Metabolism and the Kaio Medical School of Tokyo studied a group of seven Japanese medical students, three of whom showed alcohol-induced sensitivity characterized by increased facial flushing after alcohol consumption (Casazza et al. 1985). Such sensitivity, characteristic of some Orientals, has been linked to a genetically determined low activity level of aldehyde dehydrogenase and consequently to elevated acetaldehyde levels. The investigators reasoned that if elevated blood acetaldehyde levels play a role in the production of 2,3-butanediol for humans, as they have in animal studies, then the "facial flushing" group of Japanese should produce elevated levels of 2,3-butanediol when drinking (Agarwal et al. 1981).

The "flushing" Japanese and four "nonflushers" were given 0.5 g ethanol/kg body weight in an attempt to assess whether elevated body acetaldehyde can account for 2,3-butanediol production in humans. Blood was taken from the antecubital vein immediately prior to ethanol administration and 30, 60, 90 and 120 minutes after ethanol consumption. The so-called "facial flushing" group was found to have a genetically determined

Chris Dominski

Joseph P. Casazza, Ph.D., an explorer along the metabolic pathway.

low activity level of aldehyde dehydrogenase. However, neither significantly increased levels of 1,2-propanediol nor any detectable 2,3-butanediol was found in blood from any of these subjects up to 2 hours after acute administration of ethanol.

Other Clinical Studies

A large clinical study currently under way at the LM is directed towards defining the conditions in which 2,3-butanediol and 1,2-propanediol are produced. Blood serum is being obtained from alcoholics as well as from patients with alcoholic hepatitis, alcoholic cirrhosis, nonalcoholic liver disease, juvenile diabetes, or maturity onset diabetes, and from obese/anorexic patients, normal control patients, and various other patient controls. This work is being done in collaboration with the Royal Free Hospital of London.

"The identification of unusual metabolites in severely alcoholic men during acute ethanol intoxication does not, however, establish a genetic basis for the disease," Dr. Veech says. "While the findings might potentially have central significance for the identification of markers for a particular form of the disease of alcoholism, it first must be determined whether or not these metabolites are from a previously unrecognized normal metabolic pathway in humans. Firm conclusions on this point will require further metabolic and epidemiologic studies on alcoholics and nonalcoholics utilizing, where possible, twins and kinship groups."

Investigators at the Laboratory of Metabolism currently are collaborating with the National Academy of Sciences and the Harvard Medical School on a study of the presence of 1,2-propanediol and 2,3-butanediol in twins—a study that could help to determine the genetics of the production of these compounds. ■

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Issues and Implications in Genetics Research

DOROTHY T. MOORE, PH.D.

How many need to be convinced that alcoholism is genetically influenced?" When Marc A. Schuckit, M.D., put this question to scientists, medical practitioners, and journalists attending a session of the IVth World Congress of Biological Psychiatry, only two hands were raised. Evidently Schuckit's audience already belonged to "the company of the faithful."

Behind such questions looms a mounting conviction that a genetic "quirk" may help to differentiate drinkers who do become alcoholic from those who do not. What is the evidence that supports this conviction? And how far can we go toward interpreting this evidence as proof? Are there gaps in the evidence that must be filled by further research? And what are the practical implications of genetics-oriented research findings?

In the scientific tradition, showing that genetic factors cause alcoholism would require showing that an inherited predisposition to develop and maintain alcohol abuse is both necessary and sufficient. Thus far, no credible authority claims that genetics is a sufficient explanation. However, statements by some experts do convey the idea that a heritable component is necessary while others—in fact, the majority—emphasize interaction between genetic factors and the environment.

More than 40 years ago, Jellinek (1945/1972) attempted to settle this issue by declaring, "The inherited constitution is merely a suitable breeding ground for inebriety" (p. 109). He added that "even when the hereditary constitutional factor is present it does not become operative without intercurrent social factors," thus placing a major burden on environmental conditions.

The issue of the genetic impact still is not demonstrably settled, however, on the basis of scientific evidence. What we have today is a pragmatic situation in which some researchers separate alcoholics into two diagnostic groups: *primary alcoholics* (those who manifest life problems associated with alcoholism but not with a preexisting psychiatric disorder that could have a genetic basis) and *secondary alcoholics* (whose alcoholism is secondary to psychiatric problems). It is the primary alcoholics who are of most interest in genetics-oriented theories.

The key question in all the associated debates is this one: What is inherited? Everyone agrees that it would be absurd to say that "alcoholism" itself is inherited. The tendency is to insist that, because alcoholism is a complex phenomenon, any genetic component must likewise be complex, made up of several interacting elements in the genetic material of a person who is at risk.

This article is intended to serve more as a device for encouraging objective assessment of the evidence than for attempting full answers to the related questions. It will have served its purpose if it contributes to sincere efforts to discover sorely needed answers.

Quantity of Evidence

It is easy to find accounts of research on the genetics of alcoholism. In fact, one can hardly avoid exposure to such information if one attends scientific and medical meetings that include alcohol-related agenda items.

For example, at three alcohol sessions in one day during the IVth World Congress of Biological Psychiatry, genetics was the dominant theme. Another example was the alcohol research session of the 1985 annual meeting of the American Association for the Advancement of Science, a session avowedly designed for medical educators but, in fact, devoted almost entirely to genetics-oriented research. Meetings such as these occur throughout the year in addition to conferences organized specifically for discussion of genetics-and-alcoholism research (e.g., Alcoholism—the search 1985; Schuckit et al. 1985).

In-print sources of information are plentiful, too, for anyone who wants to learn about genetics issues in alcoholism research. A footnote on page 1 of "Alcoholism: An Inherited Disease" (NIAAA 1985) informs the reader that a literature search by the National Clearinghouse for Alcohol Information yielded more than 700 articles published since 1980 on genetics-related alcohol research. Add to this the fact that the current era of scientific research in this field dates back to 1960, when Kaij analyzed patterns of reported alcohol abuse in Swedish twins, and the sheer quantity of material is overwhelming.

In the popular press, outstanding science writers have contributed to the mass of information on the possible connection of genetics with alcoholism (e.g., Franks 1985; Holden 1985).

It should be noted, however, that genetics is only one among many areas of alcohol-related research, which includes fetal alcohol syndrome, liver diseases, safety problems, epidemiology of ethnic groups, women and alcohol problems, prevention strategies, brain damage, treatment strategies, and other areas of concern.

As will be seen (in the discussions below), researchers in the genetics area are not of one mind on how to test a genetics assumption—or even which assumption to accept—or on the conclusions to draw from evidence generated by each other's studies. Among scientists, though, this is par for the course. (See Moore 1985, p. 40).

Categories of Evidence

Substantial reviews of research on the role of genetics in alcoholism customarily begin by describing studies of special human populations related to alcoholics—families, twins, and adoptees. The reader should bear in mind that the goal of any research in the genetics area is to discover markers that identify individuals who are at risk to develop alcoholism. Another type of marker—say, a certain biochemical or a morphological change in liver tissue—is used for detection of alcoholism after the fact. The long-term aim in these cases is timely intervention. In the genetics context, however, the long-term aim is prevention. Meanwhile, what is learned in today's studies can set the stage for longitudinal research, if the subjects are followed for a period of years, as well as for improvements in treatment strategies.

Human Studies. There seems to be widespread acceptance of the notion that alcoholism is a familial disease. If so, what is transmitted in the family context? Is vulnerability to alcoholism based primarily—or maybe even exclusively—on heritable factors? Or is it the family environment that shapes in some of its members an inclination to abuse alcohol? The basic plan of a family study in this field is to compare families having alcoholic members with families having no alcoholics. The principal task is to tease apart the genetic and the environmental variables.

The need to separate heritable from environmental factors has led to studying twins and adoptees. Will siblings (in some studies, identical twins) who are reared in different environments show similar tendencies toward alcoholism? If so, the family environment will be considered less important than the family's genes.

Comparisons of different types of twins have long been employed in studying the genetics of psychopathology. In alcoholism research as in psychiatry, monozygotic (MZ) twins, having been formed by the division of one egg fertilized by one sperm, are assumed to be genetically identical. Shared characteristics that they manifest more consistently than do dizygotic (DZ) twins, who spring from two different egg-sperm unions, are taken to have a genetic basis.

Studies based on this assumption must include methods for neutralizing the effects of such environment-related differences between MZ and DZ pairs as socioeconomic status, education, and cultural norms. Such biology-based variables as age and sex also must be neutralized, either by closely matching MZ and DZ twin pairs or by studying large, randomly distributed samples of the two types of twin populations.

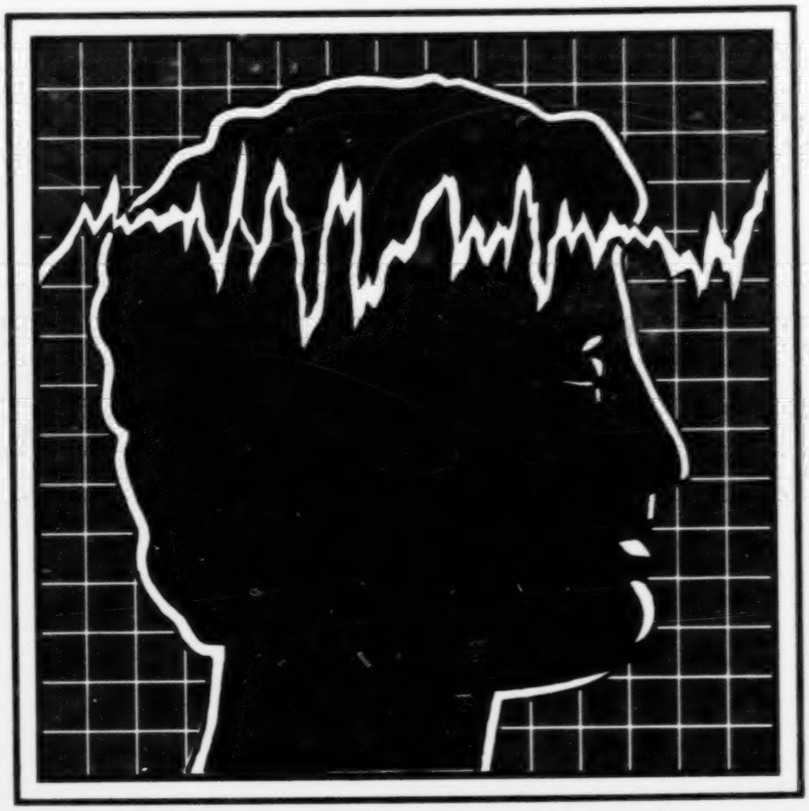
Family studies have led naturally to a special research category in which offspring (usually male) of an alcoholic parent (usually the father) are compared with the offspring of a nonalcoholic parent. In making a large number of such comparisons, the researcher must decide which differences to look for in assessing the effects of alcohol on baseline measures of neuropsychological functioning. One such difference is body sway; another kind of difference is a feeling of intoxication after taking a drink (e.g., Schuckit 1985*a*, 1985*b*). Obviously, the measurement of the various types of potential markers—some behavioral, some psychological, some biological—is a major research problem to be solved.

Even after settling on methods for comparing family members, a question of greater magnitude remains unanswered. Can "alcohol-prone" body sway or any other behavior or combination of characteristics be used to predict that such-and-such an individual will become alcoholic? Probably not, and maybe never.

Richard Feldmann, NIH Division of Computer Research and Technology

A computer-generated image of a portion of DNA.

The same question—of predictabilty—haunts the electrophysiology branch of alcohol research allied with family studies. In this controversial specialty, brain waves of offspring (usually children, and usually sons) of alcoholics are compared with those of subjects who have nonalcoholic parents. By means of button-shaped metal electrodes pasted to the scalp, observers can monitor the patterns of brain waves as they are amplified mechanically and displayed on an oscilloscope screen or on a moving paper chart bearing the marks of a delicate pen. Typically, visual stimuli or sounds are used to evoke responses of the subject's brain nerve cells. The monitored neural activities are not "evoked responses," however, because the researcher's interest centers on the delay (latency) and the magnitude (amplitude) displayed in brainwave segments that are associated with complex processes of thought and attention, not just raw sensory impressions. The name generally adopted for these brain signals is "event-related potentials" (ERPs).



In other types of brain-wave studies, the EEG (electroencephalogram) is examined for characteristics of the alpha waves that appear to distinguish high-risk from low-risk individuals.

Animal studies. Alcohol research is one of the most active fronts on which experimentation with nonhuman animals is expected to produce knowledge necessary to relieve human suffering. The development of special animal models as subjects for studying the genetics of alcohol intake and effects has been of special interest to NIAAA-supported medical research teams at the University of Colorado and at Indiana University. In the Colorado research, special strains of mice have been inbred for testing the effects of alcohol. The Indiana research, led by T.-K. Li, M.D., is focused on producing rats that satisfy the behavioral criteria for an animal model of human alcohol abuse.

In other laboratories—for example, the Salk Institute in La Jolla, CA—efforts are being made to develop animal models whose EEGs or ERPs can mimic those of human subjects in certain tasks.

Benchwork. In other specialized areas related to both family and animal studies, alcohol researchers are making use of advances in laboratory technology on several fronts. In some cases, NIAAA-supported researchers are developing new techniques of their own.

Whether in biochemical studies of ethanol metabolism or in molecular genetics research using recombinant-DNA methods, the goal is the same: to discover heritable biological markers that identify individuals at risk to develop alcoholism.

However, Boris Tabakoff, Ph.D., director of NIAAA's Division of Intramural Clinical and Biological Research, frequently reminds audiences at scientific meetings that the basic research carried out by NIAAA scientists extends far beyond the problem of alcoholism. In studying genetic regulation of ethanol metabolism, for example, it is necessary to learn about processes that turn on and turn off the expression of genes. Such fundamental discoveries are expected to shed new light on broad areas of biology and medicine.

Characteristics of the Evidence

It can be argued—and sometimes is—that the massiveness of accumulated evidence outweighs the effects of weaknesses in the individual studies. Alcohol researchers take amicable issue with each other, however, on methods and interpretations in the genetics research area as in other scientific areas. An important issue to decide in any given case is whether cumulative evidence addresses the right problem. In other words, if a piece of research is weakened by having too few subjects, for example, do other studies make up for this lack *and* report the same results?

Another crucial issue is the comparability of different studies. If interpretation is based largely on combined results from different sources, the cumulative effect may be similar to combining apples and oranges. To what extent can the differences between apples and oranges be ignored?

The definition of alcoholism. When we are told that alcoholism has a genetic—or any other—basis, what does this mean? First, we need to understand what is meant by "alcoholism."

In a classic article, Jellinek (1952) outlined and discussed phases of alcohol addiction. He differentiated "loss of control" alcoholics from those he called "nonaddictive" alcoholics. The latter type, he proposed, did not go through the phases he outlined for the development of chronic alcoholism.

Today, defining "alcoholism" is still one of the most controversial topics in the field. Disagreements of this kind call for a stated choice in the design of research. In the reports on human research, however, we find so many different definitions that we wonder how the results can be compared. Here are a few samples:

Scandinavians, more than most people, keep careful and thorough records. For Goodwin and his colleagues studying alcoholism in adopted sons and daughters of alcoholic biological parents in Denmark, official records helped to define alcoholism of the biological parents. (See Goodwin and Guze 1974; Goodwin et al. 1973, 1974, 1977*a*, 1977*b*.) In these investigations, hospital records of treatment for alcoholism served as the key criterion. This information was supplemented by interviews with psychiatrists uninformed of the subjects' alcoholism status. Alcohol-related behavior of the subjects was further classified in terms of quantity and frequency of daily drinking, with "alcoholic" as the highest classification.

An important theoretical stand taken by Goodwin (1979) on the subject of alcoholism itself is that this affliction is not merely an exaggerated form of moderate or social drinking. Goodwin's theoretical position suggests possibilities for trying to define alcoholism in ways not totally dependent on measuring the volume and counting the number of drinks consumed. This question, in turn, touches on one of the most delicate points in the genetics area of research: Can one take the concept of *alcoholism* and, having presented evidence that this is a status quite different from "heavy drinking" and other categories of alcohol use, come up with the concept of *alcoholic* as a scientifically acceptable noun? In other words, what will be the scientific criteria for calling someone "an alcoholic"? More about this later, when the issue of personality is briefly discussed.

Back to Scandinavia: For their studies of Swedish adoptees and their parents (both biological and adoptive), Cloninger and his colleagues used official Swedish Temperance Board records of reported alcohol abuse as their definition of alcoholism (Bohman et al. 1981, 1984; Cloninger 1983; Cloninger et al. 1981, 1983, 1985). This definition is different from any used in the United States because of the specific criteria used and because of cultural differences in identifying alcoholic behavior. For this reason, the definition is an approximation, very much tied to Sweden-specific conditions. In such a case, the data on men and/or women in the same general locality could be compared with some confidence; but they cannot be compared, in scientifically acceptable terms, with data from non-Swedish populations for whom alcoholism has a different set of connotations. In addition, the authors of these studies further subdivided their sample of subjects into degrees of severity of alcohol abuse. Each subsample, then, serves as a special subclass of a larger, specially defined sample of Swedish adoptees.

A significant contribution made by Cloninger and his colleagues was the differentiation, on the basis of statistical treatment by the discriminant analysis method, of their alcoholic subjects into two types: milieu-limited alcoholism and male-limited alcoholism (Cloninger et al. 1981, 1985). Both types were thought to be heritable; but the inherited susceptibility of the milieu-limited type required postnatal environmental factors to bring alcohol abuse to full expression. A most important influence of this kind, according to the data from their Swedish subjects, was low occupational status of the adoptive father. This was linked to severe manifestations of alcohol abuse in the adoptee.

Today, defining "alcoholism" is still one of the most controversial topics in the field.

Yet another definition of alcoholism is characteristic of studies resting mainly on criteria used by psychiatrists. For example, when Schuckit and his colleagues (Schuckit et al. 1972) explored the incidence of alcoholism in half siblings of alcoholics, the diagnosis depended primarily on "drinking in a manner that interferes with one's life." The consequences of such interference were listed as divorce or legal separation, job loss, two or more arrests not related to traffic violations, and hospitalization for physical or psychiatric consequences of excessive drinking. To be considered alcoholic, the subject had to exhibit at least one of these. The relevant information was obtained in "systematic interviews."

In accounts of Schuckit's more recent research on heritable markers in samples of young men in a university (Schuckit 1983, 1984, 1985*b*), the subjects respond to questionnaires and report on their own risk potential by identifying alcoholism in their own families, with life problems used to define alcoholism. Those whose family histories include an alcoholic father are assigned to Schuckit's family-history positive (FHP) group. Those without a reported family history of alcoholism make up the family-history-negative (FHN) group. Schuckit acknowledges that the self-reported history is not yet subject to a validity check. He relies on other indices for assurance.

In reviews devoted primarily to studies of human populations, both Schuckit (1985*a*, 1985*b*) and Goodwin (1982, 1985*a*, 1985*b*) have grappled with the problem of defining alcoholism. Goodwin provides a brief discussion of the difference between "familial alcoholism" and other types. Schuckit explains the differences between "primary" and "secondary" types. In presentations of his research findings, Schuckit is careful to point out that his university-based subjects score normally on a number of psychometric tests. In such cases, if alcoholism develops in a high-risk (FHP) subject, it will presumably be of the primary type, not secondary to a preexisting psychopathological condition.

Such distinctions between different types of alcoholism still leave unresolved the question of how to define the condition being studied, so as to be able to make valid comparisons of different studies. They do confirm an optimistic expectation of Russell and colleagues (1984), however, who see the focus on genetics as enabling researchers, health care professionals, and the lay public to develop an improved understanding of the various forms that alcoholism can take.

This expectation is based, of course, on the assumption that there is, indeed, more than one form of alcoholism. But a contradictory disadvantage of genetics-oriented research is apparent when in some accounts, possible subtypes are largely ignored and a monolithic, stereotyped concept of alcoholism seems to emerge.

With such an abundance of classification schemes for alcoholism, the time may be ripe for integrating two or more of them into a definition that can serve to put different research projects into a comparable framework.

Populations. Regarding alcoholism itself, it is clear that different researchers disagree as to how to define the population being studied. In advance of doing the research, their definitions vary, usually for practical reasons; and their findings are fitted into different categories. If one adds to this division of viewpoints the variation in geographic locations and in samples of subjects used to search for heritable markers of high-risk populations, the question arises: How comparable are these findings?

In the studies already mentioned, differences in nationality and culture, as well as the methods for identifying alcoholic populations, have been noted. In each case, the reported results should be stated in terms of the population supplying the subjects—e.g., "Among adopted-away sons of a sample of alcohol abusers in Stockholm, Sweden. . ."—rather than in generalized reference to sons of alcoholic fathers everywhere.

Added to cultural biases are age differences. In one study, the age range of the subjects may be 18 to 25 years. In another, it may be 51 to 61 years. In yet another, much younger ages may be included. When the oldest subjects are compared with the youngest in terms of having alcoholic relatives, however, the youngest appear to have an oversupply. This bias is introduced by reports from an adult relative speaking for the youngster and providing a more detailed family history than the eldest subjects can or will volunteer.

Regardless of age, it is fair to assume that adopted-out children of alcoholic parents belong to a population that differs in some important ways from a population living in stable family environments. For example, Murray and coworkers (1983), in their thorough and balanced critique of twin and adoption studies, raise the question of genuine paternal identification in such adoption cases.

These authors also raise questions about assumptions made in studies comparing MZ and DZ twins. They cite evidence, for example, that MZ twins have sometimes been observed and interviewed more thoroughly than DZ twins, thus possibly raising the proportion of reported parental alcoholism for the MZ group. In addition, the assumption that MZ and DZ twins do not differ in their environmental experiences should be explored (Hrubec and Robinette 1984). Much speculation about genetic causation rests on this assumption. Finally, an incompletely resolved problem in twin studies is the correct assignment of a twin pair to MZ or DZ status. In some studies, incorrect assignments may have biased the results (Saunders and Williams 1983).

When nonhuman animals serve as the study population, the usual questions arise as to whether one can leap from animal to human behavior in interpreting the results. Alcohol researchers in this area are notably cautious. Particular types of animal responses to alcohol (susceptibility to withdrawal seizures is one) are studied in detail. The principal long-term purpose for studying such animals is not so much to compare their behavior with that of humans as to learn the biological bases for strain differences in the reactions to alcohol. Deitrich and Spuhler (1984) have reviewed this research area in unusual detail and provide a wealth of practical points on the development and use of rodent strains.

It is in studying genetic control of the biochemistry of alcohol effects, some researchers believe, that animal and human research will converge to solve the mysteries of alcohol tolerance and dependence (Belknap 1980; Thacker et al. 1984).

What do the numbers mean? When N.S. Cotton (1979) reviewed 39 published research reports on genetics of alcoholism, in which families of 6,251 alcoholics and 4,083 nonalcoholics had been studied, it was found that the alcoholic subjects were more likely than the nonalcoholics to have alcoholic relatives, including siblings. At the same time, however, female alcoholics had more alcoholic relatives than did male alcoholics in most of the 39 studies. Altogether, the results looked like impressive evidence for genetic influences in alcoholism. However, among problems pointed out by Russell and colleagues (1984), (1) many studies reported data on the fathers but none on the mothers; (2) three studies reporting the highest incidence of maternal alcoholism reported results only for mothers of females; and (3) because of methods used in some studies, alcoholism rates among siblings may have been underestimated. It is also pointed out that substantial proportions—ranging from 47 to 82 percent—of the alcoholics in these studies did not come from alcoholic families, and only 40 to 50 percent of the alcoholics were commonly reported to have alcoholic near relatives (Cotton 1979).

These neglected fractions of the data in most studies reinforce the plea for answers to two key questions: If genetics is a factor in the etiology of alcoholism, what is inherited? And given a genetic component, what use will be made of this knowledge? For example, Russell and colleagues (1984) also note that discordances—not concordances—of 40 to 50 percent in MZ twins suggest rather strong environmental effects. These have received less attention than concordance figures supporting the genetics assumption. Does this mean that environmental conditions will be ignored in applying the research results to prevention strategies?

In similar vein, some logical questions can be raised about the emphases in other reports. For example, the male-limited subtype of alcoholism, in the studies by Cloninger and colleagues, was estimated to account for about 25 percent of the Swedish alcohol abusers being studied. What should be done with information on the other 75 percent, especially considering that alcoholism in females (Bohman et al. 1981) was said to resemble the milieu-limited type?

Data from other studies also suggest that if the genetic interpretation is overemphasized, we may be looking at less than half of what is potentially fruitful in the research findings. For example, in the Danish studies of Goodwin and colleagues, 18 percent of the sons of alcoholics were said to have developed alcoholic behavior, as compared with 5 percent of sons of nonalcoholics. What differentiates the alcoholic 18 percent from 82 percent of alcoholics' sons who did not become alcoholic?

Russell and colleagues (1984) cite two relatively little-known studies in which the subjects' drinking patterns fell into two groups, drinkers and abstainers. It was suggested that the choice to abstain, as well as the choice to drink, is under genetic control. If so, could the tendency to inherit a predisposition to abuse alcohol—as is emphasized in the vast majority of the published work—be of less practical importance than inherited factors that protect against the development of alcoholism? In line with this question is the frequent bypassing of women in alcohol-and-genetics research, although the reports that provide some data on women and alcoholism consistently set the frequency of female alcohol abuse far below that for men. What causes this difference? Or is the difference illusory, a product of inadequate methods? Without sufficient data, the answers to these questions are still speculative.

Meanwhile, until hard evidence is found to link human genetic material itself to the expression of alcoholism-resistant or alcoholism-prone behavior, all of the discussion hinges on treating correlations as if they were causes.

Personality. One of the most momentous issues in research on alcoholism is the question of personality variables. Is there an "alcoholic personality"? Closely related to this question is the issue of an inherited psychopathology, because of the strong influence of psychiatric definitions for alcoholism. Still another related question is this hardy perennial: Do personality characteristics associated with chronic alcoholism precede (and thus cause) the development of alcoholic behavior, or are they consequences of alcohol abuse itself?

These issues are too broad and complex to discuss in detail here. A recent review from the psychiatry viewpoint (Donovan 1986) includes descriptions and a critique of personality-related theories and research. There still exists a need for a comprehensive, up-to-date review from the viewpoint of genetics-oriented alcoholism research.

Suffice it to say here that alcohol researchers are divided on these issues, not only on research assumptions and methods but also on the practical implications. If, for example, there were such an entity as an alcoholic personality, how would that fit the current emphasis on alcohol as a disease? And what would be the effective measures to recommend for prevention and early intervention in that case? Some critics of the personality-and-psychopathology school of thought express a different concern: What impact do the related theories and research reports have on the self-image and self-confidence of alcoholics and their children? Labeling individuals in advance could have destructive rather than helpful consequences, especially if the evidence is not yet firm.

The related questions still require thoughtful discussion and elegantly designed research with compassion as a primary motive. ■

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Note to Readers: Additional information about current medical research into the heritable aspects of alcoholism is contained in the booklet "Alcoholism: An Inherited Disease," published by the National Institute on Alcohol Abuse and Alcoholism. Single copies are available at no charge from the National Clearinghouse for Alcohol Information, P.O. Box 2345, Rockville, MD 20852 (order PH218).

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(continued on page 71)

State, Regional, and National Trends in Apparent Per Capita Consumption

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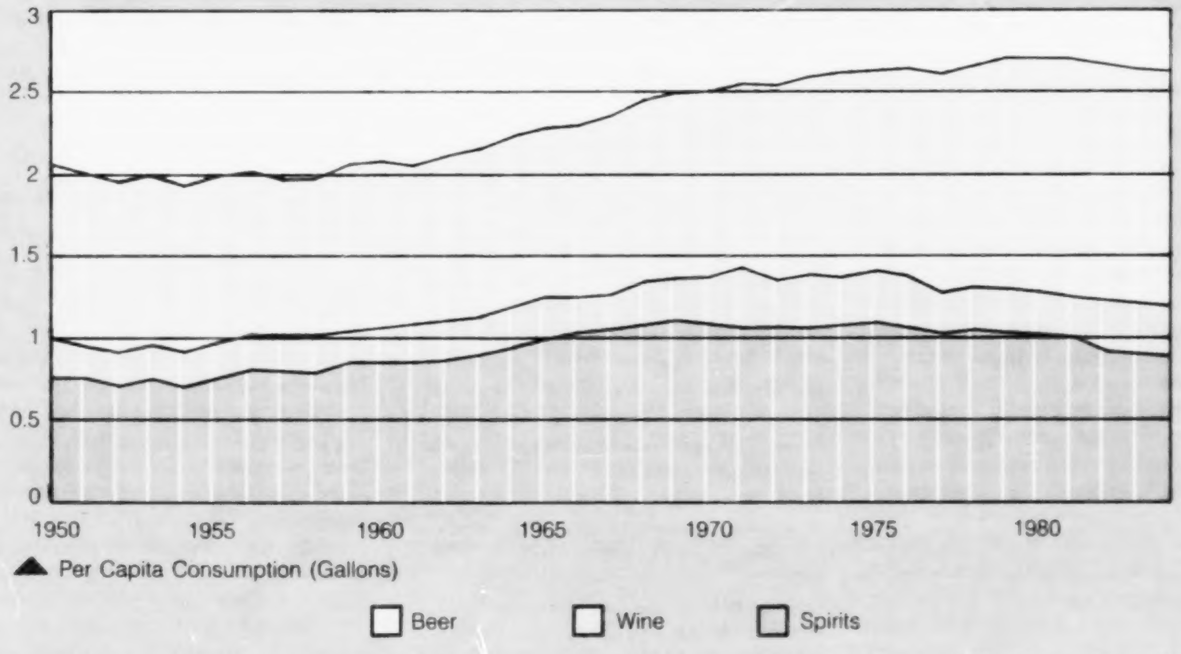
National apparent per capita consumption of beverage alcohol has continued the decline begun in 1982, dropping from 2.76 gallons (1982), to 2.69 gallons (1983), to 2.65 gallons (1984) (AEDS 1985*a*; Williams et al. 1984). This is the first time since Prohibition ended that decreases in per capita ethanol consumption have been recorded for 3 consecutive years (Noble 1986). Market analysts (Jobson 1986) suggest that the decline was likely to continue in 1985.

Another trend, a shift in beverage preferences, appears to account for part of this overall decline: Recent reductions in the national apparent per capita consumption of spirits partly offset the substantial increase—more than 25 percent—in wine consumption figures since 1977.

Another factor in the overall decline may prove to be regional in character, because the differences between 1977 and 1984 figures are not uniform, nationwide. Totals for these 2 years differ by less than 1 percent (2.64 gallons per capita in 1977 vs. 2.65 in 1984). Within-State changes, however, range from +16.6 percent for Alaska to −24.1 percent for Nevada.

Figure 1 presents an area graph of U.S. per capita ethanol consumption by

Figure 1 Apparent Per Capita Ethanol Consumption by Beverage Type, 1950–84



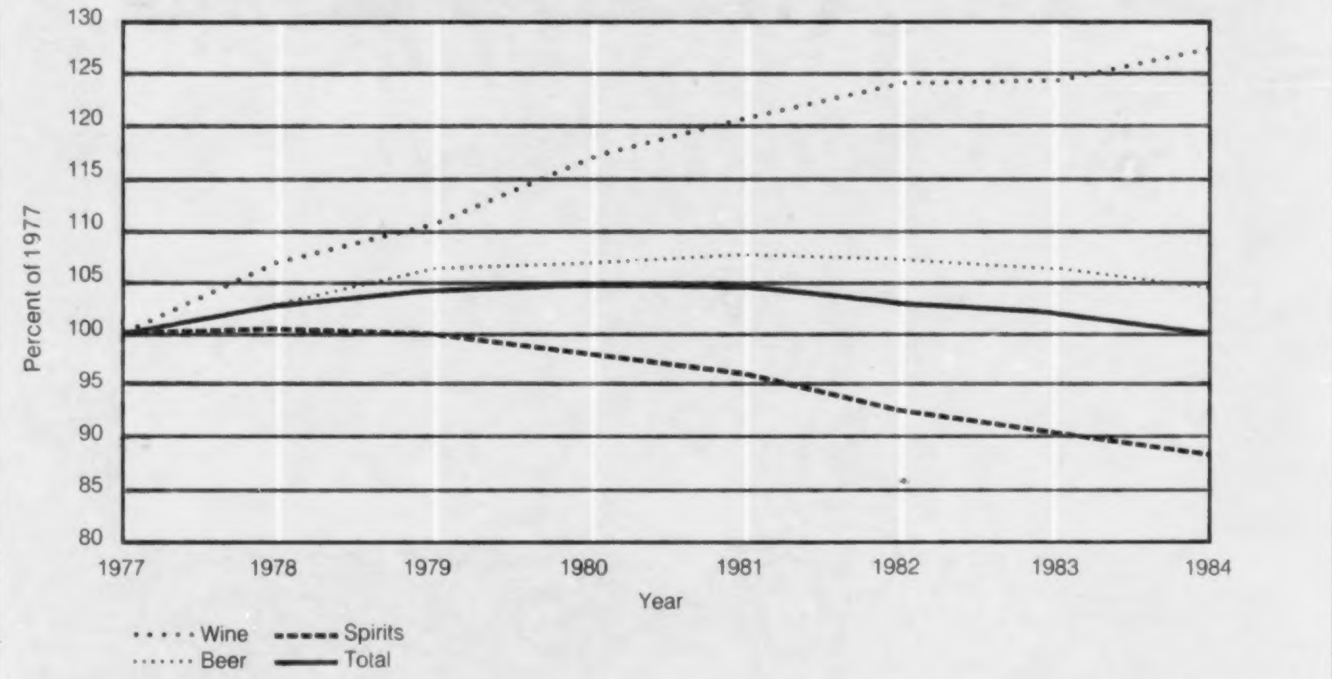
Note: Differences between earlier and later data: (1) The 1950–69 data were based on a drinking-age population of age 15 years and older. (2) Conversion coefficients for the different beverage types varied slightly prior to 1977. (3) Data prior to 1977 were based on shipments information from beverage industry sources.

Table 1 Apparent Per Capita Ethanol Consumption (in gallons) by States, 1984

	Per Capita Consumption*						% Change
State	**Beer**	**Wine**	**Spirits**	**Total**	**Rank**	**Decile**	**1977–84**
Alabama	1.02	.19	.69	1.90	47	10	−3.1
Alaska	1.73	.58	1.56	3.86	4	1	+16.6
Arizona	1.57	.45	1.06	3.08	11	3	−0.6
Arkansas	1.02	.12	.64	1.78	49	10	+7.9
California	1.38	.74	1.07	3.19	5	1	−1.8
Colorado	1.51	.46	1.12	3.09	10	2	+2.7
Connecticut	1.10	.50	1.20	2.80	20	4	+7.3
Delaware	1.51	.38	1.28	3.17	7	2	+8.9
District of Columbia	1.56	1.11	2.68	5.34	1	1	−3.4
Florida	1.48	.40	1.24	3.12	9	2	−0.3
Georgia	1.18	.23	1.06	2.48	33	7	+0.4
Hawaii	1.65	.41	.91	2.97	13	3	−8.0
Idaho	1.40	.31	.72	2.43	34	7	−3.6
Illinois	1.40	.37	1.01	2.77	21	5	−3.5
Indiana	1.26	.21	.72	2.19	40	8	+6.8
Iowa	1.36	.12	.61	2.09	42	9	−3.7
Kansas	1.18	.14	.63	1.95	44	9	+3.7
Kentucky	1.05	.12	.68	1.85	48	10	−8.9
Louisiana	1.40	.29	.94	2.63	26	5	+2.3
Maine	1.25	.31	1.01	2.57	29	6	−2.7
Maryland	1.31	.36	1.17	2.84	17	4	−6.9
Massachusetts	1.30	.51	1.24	3.04	12	3	+3.1
Michigan	1.32	.31	.97	2.60	28	6	−4.1
Minnesota	1.34	.28	1.07	2.68	24	5	+1.1
Mississippi	1.19	.11	.77	2.06	43	9	+0.5
Missouri	1.34	.25	.68	2.27	37	8	+0.9
Montana	1.70	.32	.93	2.95	14	3	−5.4
Nebraska	1.44	.20	.76	2.41	35	7	−4.7
Nevada	2.01	.82	2.36	5.19	2	1	−24.1
New Hampshire	1.99	.59	2.33	4.91	3	1	−7.7
New Jersey	1.19	.55	1.10	2.83	18	4	+5.2
New Mexico	1.71	.28	.76	2.75	22	5	−6.1
New York	1.15	.49	1.03	2.67	25	5	−2.6
North Carolina	1.11	.24	.78	2.13	41	8	+3.9
North Dakota	1.40	.17	.98	2.55	31	6	−2.7
Ohio	1.41	.25	.61	2.26	38	8	+10.8
Oklahoma	1.01	.16	.74	1.91	46	9	−3.5
Oregon	1.28	.53	.82	2.63	27	6	−4.0
Pennsylvania	1.37	.21	.66	2.25	39	8	−1.7
Rhode Island	1.37	.52	1.03	2.92	15	3	−0.3
South Carolina	1.26	.24	1.00	2.50	32	7	+0.4
South Dakota	1.27	.17	.89	2.33	36	7	−2.1
Tennessee	1.11	.15	.70	1.95	45	9	+2.1
Texas	1.74	.28	.79	2.82	19	4	+9.3
Utah	.88	.14	.52	1.53	51	10	−10.0
Vermont	1.48	.49	1.15	3.12	8	2	−9.3
Virginia	1.46	.29	.80	2.55	30	6	+10.9
Washington	1.24	.57	.91	2.71	23	5	−6.2
West Virginia	1.12	.12	.44	1.68	50	10	−9.2
Wisconsin	1.86	.30	1.03	3.19	6	2	−3.6
Wyoming	1.58	.22	1.05	2.86	16	4	−13.6
United States	1.35	.37	.94	2.65	NA	NA	+0.4

*Based on population aged 14 and older

Figure 2 Trends in Apparent Per Capita Ethanol Consumption As a Percent of 1977 Per Capita Levels



beverage type and total for the years 1950 through 1984. The graph shows a very small increase (1.0 percent) in overall per capita ethanol consumption through the 1950s, a rather rapid increase (21.3 percent) during the 1960s, a moderate increase (9.1 percent) in the 1970s, and a slight decrease (−4.0 percent) for the first 4 years of the 1980s.

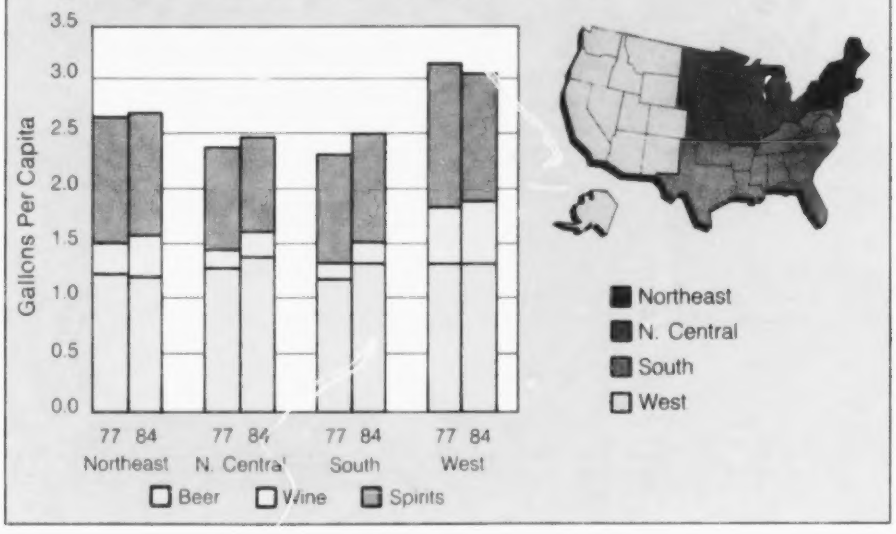
In Figure 1, the height of each separate area indicates the cumulative total per capita consumption for all beverage types under the line. Thus, the line at the top of the area for beer indicates per capita ethanol consumption for all three types of beverage.

Not all States in the U.S., however, display patterns of per capita ethanol consumption similar to the national trends. Table 1 (on the previous page), presents 1984 apparent per capita consumption of ethanol for each of the States and the U.S. as a whole. Per capita data are presented for beer, wine, spirits, and total ethanol. States also are ranked according to their total per capita consumption of ethanol. Deciles for 1984 total per capital ethanol consumption are presented along with 1977–1984 percent change figures.

The year 1977 was chosen as the base year to begin the detailed trend analysis because 1977 was the first year that the Alcohol Epidemiologic Data System (AEDS) began collecting and calculating per capita consumption from sales or tax receipt reports from the individual States. Also, since 1977 the coefficients used to convert beer, wine, and spirits to ethanol have been constant: .045 for beer, .129 for wine and .414 for spirits (AEDS 1985*a*).

While there was little difference in the total per capita ethanol consumption for the Nation between 1977 and 1984 (2.64 vs. 2.65 gallons). State differences varied considerably. Thirty of the States and the District of Columbia experienced a decrease in overall per capita consumption between 1977 and 1984; 20 States experienced an increase. The 5 States showing the greatest percentage

Figure 3 Per Capita Consumption by Region, 1977–84



Terminology

Apparent consumption—Alcohol beverage consumption calculated from reports on (1) State tax receipts, (2) beverage sales figures from some States, and (3) shipment information from the beverage industry. Prior to 1977, the data were based on shipment information provided by the beverage industry.

Conversion coefficients—The numbers used to calculate how much ethanol is contained in the average alcoholic drink. The following are in current use by the Alcohol Epidemiologic Data System: .045 for beer, .129 for wine, and .414 for spirits. The coefficient in each case is multiplied by the appropriate number of ounces (or gallons). For example, the average 12-ounce can of beer, it is estimated, contains 12 times .045 ounces of ethanol (= 12 × 4.5%), which comes to .54 ounces of ethanol.

Ethanol—The volume of pure ethyl alcohol contained in beer, wine, or spirits. A synonym for this term is *absolute alcohol.*

Per capita consumption rates—The consumption rates are expressed as quantity, per person, in gallons, where "person" is defined as a member of the drinking-age population (whether or not each person actually drinks).

Population—For statistical purposes, the ages of the drinking-age population for the years 1970 through 1984 have included 14 years and older. From 1950 through 1969, 15 years was the minimum included age.

Proof—Standard strength of ethanol content in an alcoholic beverage. In the United States, the percentage of ethanol is multiplied by 2 to obtain the proof number. For example, in a bottle of 100-proof spirits, 50 percent of the volume is ethanol.

increases in total per capita consumption since 1977 were Alaska (16.6), Virginia (10.9), Ohio (10.8), Texas (9.3), and Delaware (8.9). The 5 States with the largest percentage decreases in total per capita consumption of ethanol were Nevada (−24.1), Wyoming (−13.6), Utah (−10.0), Vermont (−9.3), and West Virginia (−9.2).

Figure 2 presents the national trends in per capita consumption of ethanol in beer, wine, and spirits, and total ethanol for each year since 1977. The data in the graph have been standardized to the year 1977 to show the relative trends of alcoholic beverage consumption over the 8-year period. Overall, since 1977 there has been a marked increase (27.6 percent) in the per capita consumption of wine and a substantial decrease (−11.3 percent) in the per capita consumption of spirits. Beer per capita consumption increased only slightly (4.7 percent) between 1977 and 1984. The trend in overall per capita consumption increased from 1977 to 1979, held steady for 1980 and 1981, and declined from 1982 through 1984.

One of the interesting patterns in per capita consumption of ethanol is a difference in consumption trends by beverage type across the four U.S. Census regions. Figure 3 presents 1977 and 1984 apparent per capita consumption of ethanol by each beverage type and each Census region.

For the U.S. as a whole, the 1984 per capita consumption of ethanol from all beverages was 2.65 gallons, compared with 2.64 gallons of ethanol in 1977 (an increase of 0.4 percent). However, regionally, the South experienced a 2.9 percent increase and the West experienced a 3.2 percent decrease, while the Northwest and North Central regions matched the national trend.

Regional differences also were present in the 1984 percentage distribution of per capita consumption by beverage type. The West, as in past years, was the largest consumer of wine (.61 per capita gallons of ethanol in 1984 compared with the national figure of .37 gallons). From 1977 to 1984, wine per capita consumption increased 26.5 percent in the Northeast, 28.6 percent in the North Central region, 42.1 percent in the South, and 13.0 percent in the West.

Conversely, per capita consumption of spirits decreased by 8.2, 12.5, 10.9,and 14.6 percent in the Northeast, North Central, South, and West, respectively. Per capita consumption of beer increased somewhat in each Census region (5.3 percent for the North Central region, 7.2 percent for the South, and 2.2 percent for the West), except for the Northeast where there was no change from 1977.

Analyses also indicate overall proportional changes in the 1977 and 1984 consumption of different beverage types. In 1977, the proportion of per capita ethanol consumption of beer was 49 percent, of wine was 11 percent, and of spirits was 40 percent. By 1984, the relative proportions for beer, wine, and spirits had changed to 51, 14, and 35 percent, respectively. Since U.S. total per capita ethanol consumption was nearly the same in 1977 and 1984, this means that the decline in spirits consumption has been offset by increases in wine and beer consumption. ■

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Authors' Note:

Data used in this study are available from the Alcohol Epidemiologic Data System (AEDS). More intensive research is under way at AEDS to link State trend data on apparent per capita consumption with data on alcohol problem indicators (AEDS 1985*b*) and trend data on State mortality rates (Colliver and Malin 1986). It also is important to note that quite different regional patterns can emerge when calculating per capita ethanol consumption using survey estimates of the drinking population, i.e., subtracting abstainers from the population base (see AEDS 1985*a*).

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DEPARTMENTS

Research Reports

Editor's note: This article is based on a paper authored by Richard Longabaugh, Ed.D., and Martha Beattie, M.A., and presented by Dr. Longabaugh at the 1985 annual meeting of the American Psychological Association in Los Angeles, CA. Dr. Longabaugh is director of evaluation at Butler Hospital in Providence, RI. He is also professor of psychiatry and human behavior and associate director of the Center for Alcohol Studies at Brown University in Providence. Ms. Beattie is a research associate at Butler Hospital.

Social Investment, Environmental Support, and Treatment Outcomes of Alcoholics

Despite improving research designs and methods of measurements, studies of treatment outcomes with alcohol abusers continue to show somewhat equivocal results. While treatment appears to be at least somewhat helpful, the variance in outcome explainable by treatment variables is meager in comparison with that which remains unexplained. Moreover, patient variables, while also modest as predictors of outcome, tend to be more robust in this respect than treatment variables. Tests of the matching hypothesis—that certain patient-treatment combinations should be more effective than the same treatment with different patients or different treatments with the same patient—have not as yet revealed any significant breakthroughs.

It has been shown (e.g., Finney et al. 1980) that the environments in which treatment takes place and to which the patient returns are also factors in accounting for treatment outcomes. The influence of these environments has been long suspected but not directly addressed by research. A direction for treatment research, therefore, is to bring the environment into the matching hypothesis. Theory should foretell what kinds of patients with what kinds of social environments will differentially respond to which kinds of treatment interventions.

This paper describes one such theory and briefly cites data on its support. It hypothesizes how patient, environment, and treatment variables should be interrelated and describes an ongoing study designed to test these hypotheses.

The theory proposed here is embodied in a rudimentary but comprehensive prognostic model for accounting for patient outcomes. It suggests that an alcohol abuser's status at any point in time is a function of five variables: (1) the person's "alcohol health" (degree of dependence on alcohol); (2) the person's psychological health; (3) the supportiveness of the person's social environment of his or her "alcohol health;" (4) the social environment's support of the person's psychological health, and (5) the person's investment in this social environment.

Severity of alcohol dependence is often—but not always—a modest predictor of treatment outcome, with more severe dependence working against good outcomes (Gibbs and Flanagan 1977). Psychological health, measured as a general construct independently of severity of dependence, is often a predictor of good outcomes (McLellan et al. 1983).

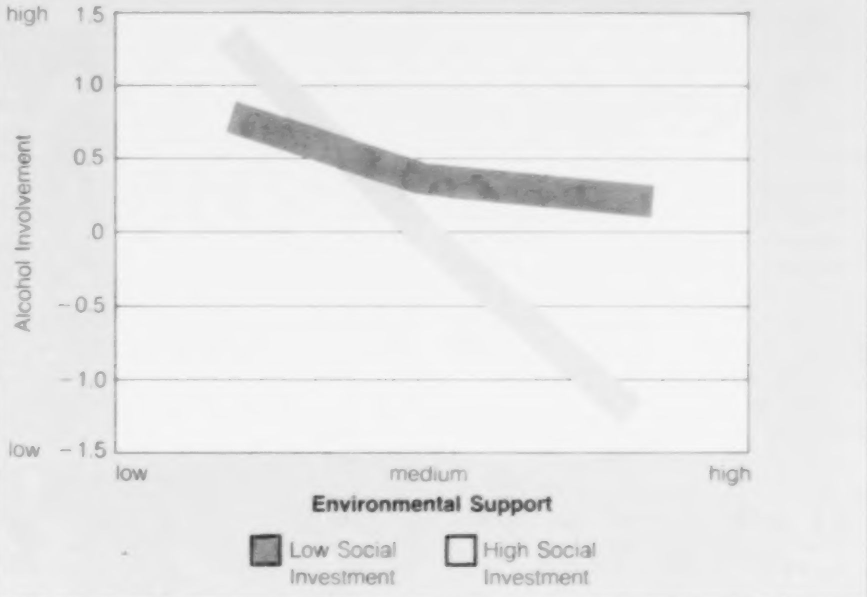
The importance of a person's social environment is a more recently demonstrated research finding. While it generally appears to be a powerful predictor of outcome (Finney et al. 1980), like other prognostic factors it is more important at some times than at others. A likely fruitful area of research is the dissection of this environment into discrete variables. Just as alcohol dependence and psychological health have emerged as multidimensional constructs, so is this proving to be the case with the social environment.

Considerable effort will undoubtedly be needed to provide an adequate map of this terrain. For the present, this model makes one broad division of the social environment — its support of the person's alcohol health vs. its support of psychological health. While these two constructs no doubt are correlated, they are unlikely to be the same thing.

An important feature of this model is the hypothesis that the social environment will not have the same impact upon all alcohol abusers. Rather, the impact of the social environment on the person's alcohol and psychological health will be a function of its importance to the individual. This importance is termed the person's *investment* in the social environment. People with a great investment are those who deeply and vividly experience the social environment as a source of rewards and punishments. In contrast, those who are markedly less affected by variability in their social environment are less invested in it.

Work currently under way is making

Figure 1 The Relationships Between Environmental Support, Social Investment, and Alcohol Involvement for 178 Patients Entering Treatment



a comprehensive test of this hypothesis. However, preliminary results from an early study of 178 patients entering treatment (Longabaugh et al. 1983) can be reported.

Three of the model's five variables were incorporated in the study design: (1) the extent of the person's alcohol involvement, (2) the supportiveness of the person's social environment, and (3) the person's investment in this social environment. Alcohol involvement was defined in terms of the patient's self-reported alcohol consumption over the previous 6 months, number of days of sobriety during this period, quantity and frequency of consumption during the month prior to treatment, and physical consequences of alcohol consumption. These data for each patient were supplemented by data from one of the patient's "significant others."

Social support was indexed by patients' responses to items on a self-report questionnaire (Feragne et al. 1983) that provided data on social interactions with others and focused specifically on trust, conflict, and stress.

Social investment was defined by the amount of contact the patient had with his or her designated significant other prior to treatment and the presumed intimacy of the relationships with any cohabitants (friends, family other than spouse, or spouse).

A two-way analysis of variance was performed, with alcohol involvement as the dependent variable and two levels of social investment and three levels of social support as the independent variables. The results are graphed in Figure 1. As can be seen, for patients with a high investment in their social environments, the supportiveness of the environment made the most difference: highly supported patients had less alcohol involvement prior to treatment, while those with unsupportive environments had the highest alcohol involvement. In contrast, for patients with low investment in their social environments, amount of alcohol involvement was less related to the supportiveness of the environments.

These results are consistent with predictions derived from the prognostic model. However, the measures are crude and the analysis, exploratory. It remains to test these hypotheses across a series of pre- and posttreatment data points, using more crisply conceptualized measures of environmental supportiveness and social investment. Moreover, even if the hypotheses survive repeated testing, the model must still be related to treatment interventions.

This is the rationale for our current study, which is testing the differential effectiveness of various patient-treatment combinations. The combinations are derived from hypothesized best fit between different types of patients (as described by the prognostic model) and intervention programs designed to emphasize different foci for treatment.

To this point, the environment has been discussed only in terms of its support of alcohol and psychological health, and social investment has been treated as though it were a single variable. This is probably unrealistic, because most people inhabit innumerable social environments and are differentially affected (both rewarded and punished) by all of them. Much of this differential value can be subsumed under two constructs: instrumental value and affiliative value. Some people place greater value on—are more invested in—instrumental roles, i.e., those that emphasize work and achievement even though the work is performed in a social setting. Others are more invested in affiliate roles, such as that of family member, in which the rewards and punishments depend more on the quality of personal interaction than on the outcome of any tasks that may be shared.

Our current therapy program and research design attempt to take account of the variable importance people attach to these two dimensions of the social environment. Operationally, we are attempting to measure these different facets of a person's social environment and his or her investment in them. As shown in Table 1, investment is measured at the societal level by work and spouse role occupancies (e.g., employed or unemployed, married or unmarried); at the interactional level, by self-reported importance of activities and people and time spent involved

Table 1 Instruments for Measuring Environmental Support and Social Investment in a Treatment/Research Cohort

Environmental Support	–of Alcohol Health	–of Psychological Health
In Affiliative Roles	Significant Other Behavior Questionnaire[1]	Family Assessment Device (Epstein et al. 1982) Social Support by Friends and Families (Procidano and Heller 1983)
In Instrumental Roles	Your Work Place[1]	Work Environment Scales (Insel and Moos 1974)
Social Investment	Affiliative	Instrumental
Societal	Occupancy of Spouse Role	Occupancy of Work Role
Interpersonal/ Relational	Self-Reported Importance of People[1] Time Spent with People[1]	Self-Reported Importance of Activities[1] Time Spent in Activities[1]
Personality	Interpersonal Dependency Inventory (Hirschfeld et al. 1977)	

[1] *This instrument was developed by project staff for purposes of measuring the specific construct.*

therein; and at the psychological level, by the Interpersonal Dependency Inventory (Hirschfeld et al. 1977). Instrumental and affiliative role supports for psychological health and alcohol health are also each individually measured.

In the current protocol, patients are randomly assigned to one of three treatment programs. The first program is 16 sessions of group therapy in which the patient is the sole focus of treatment. It is hypothesized that this modality will be most effective for those who are least invested in their present social environments.

The second program reduces the group component to six structured sessions focused on maintaining alcohol health. Little direct attention is given to psychological health. Instead, the remaining 10 sessions are devoted to partners therapy, in which the patient and one or more significant others in the patient's social environment focus on ways to increase the relational support of the patient's alcohol health and to enhance the quality of the relationship. It is hypothesized that this modality will be most effective for patients who are most highly invested in their social environment even though it has not been supportive.

The third program includes the six group sessions focused on maintaining alcohol health. The partners' sessions are reduced to six and the remaining four sessions are conducted with an occupational therapist who focuses on enhancing the supportiveness of the patient's alcohol and psychological health in goal-oriented pursuits such as vocational activities. The hypothesis is that this modality will be most effective for patients who are highly invested in an unsupportive work environment.

It is anticipated that the results of this study will enable us to refine the prognostic model and better articulate its relationship to treatment interventions.

The research described herein is supported by a grant from the National Institute on Alcohol Abuse and Alcoholism to Dr. Longabaugh (who is principal investigator) and his collaborators: Martha Beattie, M.A.; Nora Noel, Ph.D.; Ed Fink, M.D.; and Robert Stout, Ph.D.

For more information, contact Dr. Richard Longabaugh, Department of Evaluation, Butler Hospital, 345 Blackstone Boulevard, Providence, RI 02906.

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Alcohol and the Immune System

Alcohol use and abuse may compromise human defenses against infection and lower inhibitions against unsafe sexual practices, according to research discussed at a recent workshop convened by the National Institute on Alcohol Abuse and Alcoholism. At the conference, a panel of 21 experts representing the disciplines of immunology and infectious diseases, epidemiology, alcohol and drug abuse research and treatment, and communications met to review current knowledge about the relationship between alcohol use and acquired immune deficiency syndrome (AIDS) and related disorders.

Three formal papers were presented and discussed at the conference. The first, by Rob Roy MacGregor, M.D., chief of the infectious diseases section of the Department of Medicine, University of Pennsylvania, summarized existing knowledge of alcohol effects on the immune system. MacGregor noted that observations of a relationship go back at least 200 years, when the American physician Benjamin Rush published "An Inquiry into the Effects of Ardent Spirits Upon the Human Body and Mind" and claimed that tuberculosis, pneumonia, and yellow fever were complications of alcohol abuse. More recent and systematic research in Canada and at Yale University supports this early work.

According to MacGregor, the four major components of defense against infection—polymorphonuclear leukocytes, cell-mediated immune mechanisms, cellular clearance mechanisms, and humoral immune mechanisms—are all adversely affected by alcohol. "Clinical evidence indicates that alcoholism predisposes to infection and increases its severity, suggesting that alcohol interferes with normal immune host defense mechanisms," he said.

In the second paper, Robin Room, Ph.D., senior scientist at the Alcohol Research Group in Berkeley, CA, discussed possible relationships between alcohol and AIDS in terms of alcohol use by high-risk populations such as intravenous drug users and homosexuals. He included in his discussion the effect of alcohol-induced disinhibition on drug use and unsafe sexual practices. Cautioning that the evidence is "spotty," Room said, "It seems reasonably clear that intravenous drug use is strongly associated with heavy alcohol use." Likewise, the ethnographic and documentary evidence suggests that relatively heavy drinking has been widespread within the homosexual community, though not necessarily more so than in the general population.

Room further stated that, in view of the cultural belief in alcohol's disinhibiting power and given the dominant norms about needle use and about sexual behavior. "It is likely that intravenous needle use and sex practices now known to be unsafe have long been more likely when drunk than sober." With respect to prevention, Room argued that studies of drinking and disinhibition may yield the greatest gains.

Lastly, Tom M. Smith, M.D., director of the Alcoholism Evaluation and Treatment Center at San Francisco General Hospital, presented and led the discussion on the information needs of the at-risk and general populations. Smith's expertise derives from his association with a 4-year-old effort to incorporate alcohol and drug abuse information into AIDS prevention and treatment efforts in San Francisco. The literature of this program, being candid as well as oriented to the values of the target audience, emphasizes the connection between alcohol and AIDS. It includes information on the immunosuppressive and disinhibiting effects of alcohol and suggests the possibility that alcohol may promote full-blown AIDS in asymptomatic but seropositive individuals, according to Smith.

Discussions of these papers formed the basis for conference participants' recommendations for further research. Specific research programs were suggested on alcohol and the immune system, disinhibition, the roles of alcohol and stress in the development of AIDS, the effects of the HTLV-III virus on brain function, and educational programs to combat AIDS.

—Thomas Prugh

***Note to Readers:** The National Institute on Alcohol Abuse and Alcoholism, the National Institute on Drug Abuse, and the National Institute of Mental Health are seeking to fund research exploring the relationships among chemical use and abuse, immunological problems, and related mental health considerations. Copies of the research grant announcements, "Alcohol, Drug Abuse, and Mental Health Aspects of Acquired Immunodeficiency Syndrome" (MH-86-09) and "Research Grants on Alcohol and Immunology* Including Acquired Immunodeficiency *Syndrome" (AA-86-03), can be obtained by writing to the National Clearinghouse for Alcohol Information, P.O. Box 2345, Rockville, MD 20852.*

News Notes

Alcohol Warning Notice Handbook Available

Concern over the incidence of birth defects in children born to mothers who drink during pregnancy has prompted several communities in the United States to enact legislation requiring vendors of alcoholic beverages to post signs warning of the danger (see page 36, "Point-of-Purchase Health Warning Notices"). Now the Center for Science in the Public Interest has published a handbook for individuals or organizations working toward the passage of similar legislation in their own communities.

Titled "Alcohol Warning Signs: How to Get Legislation Passed in Your City," the booklet includes a brief description of the effects of alcohol on the fetus; arguments in favor of warning signs; rebuttals to counterarguments; and advice on forming a coalition, drafting legislation, lobbying, and relating to the media. Appendices include information on fetal alcohol syndrome, a brief review of research on alcohol consumption and pregnancy, copies of ordinances already in effect, and a list of resource organizations.

The booklet costs $4.95. Copies or further information can be obtained from the Center for Science in the Public Interest, 1501 16th Street NW., Washington, DC 20036.

—Thomas Prugh

Resources for Graduate Study in Alcohol and Drug Abuse

Lesley College, located in Cambridge, MA, offers a Master of Science in Management (M.S.M.) degree with a concentration in the management of substance abuse services. The college recently announced that this degree is now available on a nonresident basis; however, nonresident candidates are required to come to Cambridge four times per year during each of the program's 3 years for 1-week intensive residencies. The program's sixth cycle begins in November 1986. For more information, contact the Management Division, Lesley College Graduate School, 1627 Massachusetts Avenue, Cambridge, MA 02138.

A Master of Arts degree in clinical psychology with a concentration in substance abuse services is now offered by the Illinois School of Professional Psychology. The 2-year, 54-credit-hour program includes 500 hours of practicum experience in substance abuse counseling and therapy. Skills related to therapy in substance abuse treatment settings are emphasized. Evening classes are available to those who wish to enroll as part-time students. For further information, contact the Illinois School of Professional Psychology, 220 South State Street/1 Quincy Court, Chicago, IL 60604.

First- and second-year medical students with an interest in alcohol problems may wish to investigate the scholarships for the study of alcohol and other drug dependencies offered by the J.M. Foundation of New York City. Two hundred and forty awards will be made during 1986, enabling medical students to attend 1 of 14 summer schools of alcohol studies held at various universities and other institutions across the country. Each scholarship covers tuition, room, and board, as well as a travel-and-expense stipend. Students apply directly to an appropriate summer school, which then selects scholarship recipients. Participating institutions include the University of California at San Diego, the Rutgers Center of Alcohol Studies, the University of Utah, and Columbia University. For more information, contact the J.M. Foundation, 60 East 42nd Street, Suite 1651, New York, NY 10165.

—Thomas Prugh

Hospital Provides for Special Needs

The alcoholism treatment facility run by the South Oaks Hospital in Amityville, NY, has begun offering a program designed to accommodate the dietary and religious needs of Jewish patients who strictly observe Jewish laws and customs.

"The philosophical orientation of observant Jewish people is respected at South Oaks," according to Leonard W. Krinsky, Ph.D., executive director of the Hospital. "The Sabbath and all holidays are observed, and special arrangements have been created to accommodate dietary laws and other religious needs. Our staff has undergone inservice training so that they are all aware of these special needs."

Safety Update

For more information, contact Dr. Leonard W. Krinsky, South Oaks Hospital, Amityville, Long Island, NY 11701; telephone (516) 264-4000, x. 460.

—Thomas Prugh

Public Drinking Research Bibliography Available

The Addiction Research Foundation of Ontario has published the 18th in its series of bibliographies, this one entitled "Studies of Drinking in Public Places." The book contains citations and annotations for 151 studies, some conducted as long ago as 1897, of the nature and function of different drinking establishments, patron characteristics, situational influences on drinking behavior, and associated problems. The titles suggest some of the breadth and diversity of the research done in this area; they range from "Alcohol and Aggression: A Field Study" to "Face-Saving at the Singles Dance."

The bibliography is cross-indexed by author, research locale, and methodology and is intended as a resource for researchers and policymakers. For copies or more information, contact the Addiction Research Foundation, Marketing Services, Dept. 456, 33 Russell Street, Toronto, Ontario M5S 2S1, Canada.

—Thomas Prugh

Alcohol-related Birth Defects Conference

The Program on Alcohol Issues of the University of California, San Diego, will hold a conference Oct. 19-21, entitled Alcohol-related Birth Defects: Implications for Policy. Participants will consider current research on the subject and weigh options for avoiding the occurrence of alcohol-related birth defects.

"The premise is that alcohol affects all fetal organ systems and can lead to congenital birth defects which include growth deficiency, facial malformations, central nervous system dysfunction, and major organ system disruptions," says Tom Colthurst, director of the Program on Alcohol Issues. "Specific topics that will be addressed at the conference include research findings, prevention opportunities, and public policy implications."

For further information, please write Tom Colthurst, Program on Alcohol Issues, UCSD X-001, La Jolla, CA 92093.

Alcohol and Highway Safety Proceedings Published

The Rutgers Center of Alcohol Studies has published the Proceedings of the North American Conference on Alcohol and Highway Safety, held at The Johns Hopkins Medical Institutions in June 1984, as the 10th supplement to the *Journal of Studies on Alcohol.*

The conference—sponsored jointly by the Alcoholic Beverage Medical Research Foundation, The Johns Hopkins Medical Institutions, the National Highway Traffic Safety Administration, and the National Safety Council—attracted about 250 participants, who heard papers and panel discussions on three major topics: the epidemiology of traffic crashes; the pharmacology of alcohol, with reference to the impairment of driver performance; and countermeasures. Among the main conclusions of conference participants, as interpreted by the editors of the proceedings, are the following:

- In North America, the absolute number of traffic fatalities and the fatality rate have both declined in recent years. The proportion of fatal accidents in which alcohol is a major factor seems to be roughly stable over this period.
- Risktaking is described as the "central phenomenon" in drinking and driving. It is noted that severe penalties historically have failed to deter drunk driving; certainly death, the "ultimate penalty" in many cases, has not done so.
- The severity of a penalty is less important than the likelihood of its being applied.
- Programs designed to educate or rehabilitate drivers arrested for driving while intoxicated are of little value in reducing the incidence of alcohol-related accidents.
- Drunk-driving behavior is more readily influenced by community pressure than by laws; however, such changes (often the result of the efforts of social action groups) tend to by cyclical.

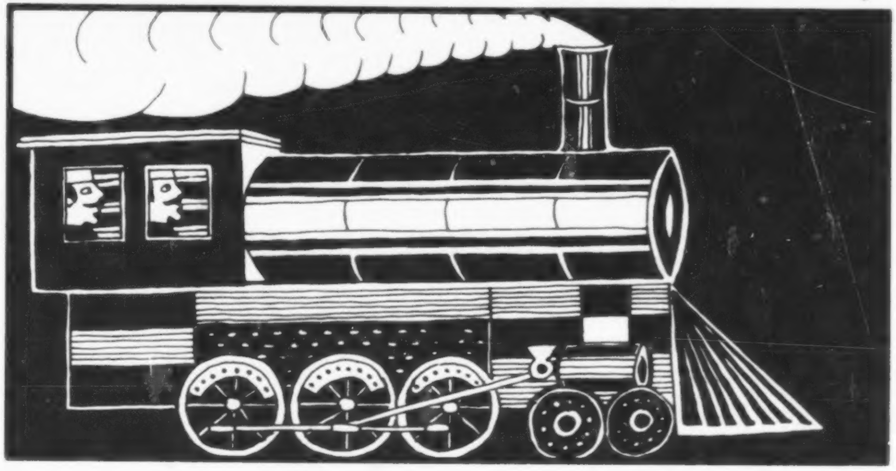
The 230-page supplement is available from the Publications Division of the Rutgers Center. For more information, contact Peggy Baker, Rutgers Center of Alcohol Studies, Smithers Hall, Busch Campus, Piscataway, NJ 08854.

—Thomas Prugh

New Railroad Alcohol Use Rule

Concern within the Federal Railroad Administration (FRA) over the failure of existing policies to prevent incidents of alcohol and drug use among onduty railroad workers has prompted the agency to draw up a new regulation entitled "Control of Alcohol and Drug Use in Railroad Operations."

The FRA has conducted studies suggesting that most violations of existing rules go undetected and that as many as 23 percent of railroad operating personnel are problem drinkers. Until recently, the railroad industry itself was responsible for establishing policies to prevent alcohol and drug use on the job, but the industry's



"Rule G" depends heavily for its enforcement on the willingness of railroad workers to report alcohol and drug use incidents among their colleagues. Reported violators risk immediate dismissal, and FRA officials believe that this arrangement leads to a very low rate of detection, perhaps as low as 1 in 200 incidents.

The new regulation, which took effect in February 1986, is intended to eliminate this problem. Its six provisions include

- prohibitions against reporting to work impaired by alcohol or drug use and against on-the-job use of alcohol and drugs, except for prescription drugs authorized by a physician;
- mandatory toxicological testing of employees involved in significant accidents;
- permission for railroads to test employees for impairment when there is just cause;
- mandatory improved accident reporting;
- mandatory preemployment drug screening of candidates for "safety-sensitive" positions; and
- the requirements that railroads establish voluntary referral policies to encourage alcohol- or drug-abusing employees to seek treatment through employee assistance programs and that railroads adopt "bypass" policies permitting first offenders to seek treatment rather than submit to disciplinary proceedings.

In addition to promulgating the new rules, FRA has also actively encouraged railroads to develop voluntary prevention programs for their employees. In November 1984, FRA awarded a contract to the Union Pacific Railroad to produce a model alcohol and drug abuse prevention program. It later sponsored regional seminars to acquaint other railroad and union officials with the program.

For further information, contact Julie Mann, Office of Public Affairs, Federal Railroad Administration, 400 Seventh Street SW., Washington, DC 20590.

—*Thomas Prugh*

Occupational Arena

Work Organizations Research Project

A team of researchers at Tulane University in New Orleans has concluded a data-collection phase of a unique, NIAAA-supported research effort into the current state of occupational alcoholism programming in the United States. Under the direction of Paul Roman, Ph.D., and Terry Blum, Ph.D., team members of the Work Organizations Research Project have visited 480 program sites in six States (California, Michigan, Minnesota, New York, North Carolina, and Texas). A major purpose of the 3-year project—perhaps the largest and most comprehensive of its kind to date—is to "get a feel for what exists today in the field of EAPs [employee assistance programs]," according to research assistant Frederica Claiborne.

Analysis of the data collected by the Tulane team, which has just begun, is expected to provide a basis for many future papers. However, Claiborne and fellow researcher Linda Kelley were able to discuss preliminary results and impressions.

Only company locations with at least 500 employees were studied. About 70 percent of these firms operated their own (internal) programs; the median size of this group was 1,500 employees each. The remaining 30 percent operated external programs, i.e., they contracted with an outside provider for the necessary intervention and treatment services.

The sample companies adopted EAPs for several reasons. Some felt that they were generally of benefit to company and employee alike and that company productivity was better enhanced by rehabilitating troubled employees than by firing them. Firing people—especially highly-trained, upper-level managers—is costly: "One remark I heard several times was that the most expensive thing a company can do is fire an employee," said Claiborne.

About 15 percent of the firms studied said that EAPs were valuable in "taking the pressure off supervisors as they deal with troubled employees," according to Kelley. A further advantage, for some, is the positive publicity value of an EAP. What was once seen as a liability—because of management's fear that setting up a program proclaimed "We're the company with the drunks"—has become an asset.

Although internal programs were more common among the larger firms and external programs among the smaller, size was not the only factor in the choice. Some companies selected external contractors, in the expectation that costs would be lower and fears about confidentiality more completely allayed. Claiborne believes that others felt handicapped by their lack of experience in the management of a specialized service: "In other words, 'stick with the knitting' and don't get involved in something you don't have expertise in," she said.

The preliminary results suggest that there may be certain characteristic differences in performance between internal and external programs, according to Claiborne and Kelley. For example, internal programs, which are set up within the management infrastructure, seem to benefit from the resulting supervisory and managerial input. Constructive confrontation of troubled employees and subsequent referral to an EAP is more likely. In addition, "Internal programs have higher rates of returning people to the job with adequate work performance, in cases with drug and alcohol problems," said Kelley.

In contrast, workers in companies with external EAPs tend to refer themselves. One apparent result is that many of these caseloads are heavily weighted with family problems and troubles other than drug or alcohol abuse. Also, the reporting required of external contractors is usually minimal and company-EAP liaison personnel often professed frustration with the EAP service providers' reluctance to disclose anything about workers who were using the programs. While confidentiality is protected by this practice, it also hinders company efforts to assess EAP performance.

Among other first-impression highlights noted by Claiborne and Kelley:

- Upper-level managerial people appear not to use EAPs very much. Where they do, it may be because the supervision of the programs is assigned to highly placed executives. However, in some cases there appears to be an inverse relationship between utilization by management and by the rank and file. Thus, one of the challenges for management is to structure programs so that everyone feels comfortable with them. Project staff visited a number of sites where the EAP programming was developed jointly by unions and management; these programs seemed well received by all.

- The researchers have found little support among the sample companies for routine blood or urine screening to detect drug and alcohol use by employees, except in firms where safety issues loom large.

  Resistance to mass screening derives from distrust of the screening technology and from the fear that EAP credibility and effectiveness would be compromised.

- Very few companies systematically evaluate their EAPs, whether they are internal or external. "It's almost as though it's a given that an EAP is going to benefit a company," said Claiborne. "If they've set up the program, they've believed that from the beginning. They don't really demand to see anything on paper." Scientific evaluation is also a formidably complex and difficult enterprise, of course, but a few of the sample firms have undertaken the task.

For further information, contact Dr. Paul M. Roman, Department of Sociology, Tulane University, New Orleans, LA 70118.

—Thomas Prugh

Perspectives

(continued from page 45)

hosts are approaching the issue as a new way of doing business rather than as a temporary aberration that must be endured. For these employers, staff training becomes an ongoing process and they actively undertake to educate patrons about the new philosophy and to win their support.

As with the producers, this shift in operating style will require a high degree of creativity and resourcefulness to maintain acceptable levels of profit. Most often, this will involve putting an increased emphasis on the sales of food and nonalcoholic beverages. It can also include the substitution of low-alcohol beverages for regular ones. This strategy does not decrease revenues, since the same number of drinks is sold, but it does decrease the consumption of absolute alcohol. An additional variation involves pricing beverages according to alcohol content within each beverage type. This innovation may actually be able to increase revenues while reducing the consumption of absolute alcohol.

There are two principal roles for government in the server-responsibility issue: clarifying the rules and educating the public. With respect to the former, government should specify, through legislation and regulations, what is expected of producers and commercial hosts. For example, it should make clear that serving to intoxication is illegal and it should define precisely what "intoxication" is so that servers are able to conform with the law. As a minimum, legislation should be in place to govern the serving of patrons to intoxication and overserving driving patrons. Furthermore, this legislation should establish statutory liability in each case, in the event that commercial hosts breach these duties.

In its educational role, government should make a serious attempt to inspire people to become low-risk drinkers. A necessary first step is the massive task of informing people about *how* to be low-risk drinkers. The task requires explicit prescriptive messages (perhaps based on those outlined earlier) dealing with intoxication, drinking-and-driving, and a variety of other risk-drinking behaviors. The campaigns should be consistent with solid principles of behavior change. Finally, they should be implemented over extended periods of time so that they can become foundations for widespread behavior change, similar to what has happened with smoking.

The educational role for government naturally overlaps with the concept of consumer responsibility. In an ideal society, all drinkers would know the "low risk" limits and would have adopted them in the interests of their health and social well-being. In reality, however, the average drinker knows very little about risk thresholds. At best, he or she will have a vague notion that it is undesirable to "drive drunk," and may well equate this with BACs of .15 to .20 percent.

We have fostered consumer ignorance and confusion through the morass of vague and contradictory drinking messages that pervade North American society. We cannot begin to hope for consumer responsibility until we begin to transmit concise, consistent messages about what is and what is not healthy. Stated simply, people must first know what to avoid before they can embrace the alternative. These messages must be developed and transmitted through a variety of media and programs, including public education campaigns, school education programs, and programs for social hosts. At the same time, we must reduce the number of contradictory messages and prescriptions that are sent out in our press, electronic news media, entertainment media, and advertising.

Perhaps our most important lesson comes from our experience with smoking: Before any significant change could occur, we first had to agree that the behavior posed a serious risk to health. With alcohol, the task is more complex: Here, "risk drinking" is the enemy, and we have yet even to agree on its definition. ■

Resources

Following are resources for keeping up with the developments in server responsibility and related areas:

- **Dram shop laws and legislation**

  Prevention Research Center
  Attention: Victor Colman, J.D.
  2532 Durant Avenue
  Berkeley, CA 94704

  National Safety Council
  Attention: Nancy Berk
  Office of Federal Affairs
  1705 DeSales Street NW
  Washington, DC 20036

  National Alcoholic Beverage
  Control Association, Inc.
  4216 King Street West
  Alexandria, VA 22302

- **Dram shop rulings and judgments**

  Liquor Liability Journal
  Donald H. Nichols, Editor
  P.O. Box 2153, Loop Station
  Minneapolis, MN 55402

  Dram Shop and Alcohol Reporter
  Ronald S. Beitman, Editor
  P.O. Box 590
  Falmouth, MA 02541

- **General information and developments within the hospitality industry**

  Responsible Beverage Service
  Newsletter
  James E. Peters, Editor
  Intermission, Ltd.

56 Main Street
Northampton, MA 01060

- **Liability insurance trends**

  Alliance of American Insurers
  Attention: Barry Walker, Associate Vice President for Public Affairs
  1501 Woodfield Road
  Suite 400 West
  Schaumburg, IL 60195

  American Insurance Association, Inc.
  Communications Department
  85 John Street
  New York, NY 10038

- **Drunk and Drugged Driving Awareness Campaign**

  Sandy Katz, Public Affairs Specialist
  National Institute on Alcohol Abuse and Alcoholism
  Prevention and Public Education Branch
  5600 Fishers Lane, Room 16C-14
  Rockville, MD 20857

  Jerry Byrnes
  U.S. Department of Transportation
  National Highway Traffic Safety Administration
  Office of Alcohol and State Programs
  Room 5130, NTS-21
  400 Seventh Street SW,
  Washington, DC 20590

- **Point-of-Purchase Health Warning Notices**

  Center for Science in the Public Interest
  Attention: Debbie Schecter
  1501 16th Street NW,
  Washington, DC 20036

Note: A special order form is provided on the inside back cover so that readers may request single copies of NCALI inventory items related to server responsibility issues. Items to be included are listed below:

MS297	Alcohol Impaired Driving Facts (1982)
MS311	Alcohol Resources Update—Alcohol and Safety
MS312	Alcohol Topics Fact Sheet—Alcohol-Related Fatal Motor Vehicle Accidents (1983)
MS314	Update: Activity Sampler for College Prevention Programs
MS317	2nd National Conference for Youth on Drinking and Driving
PH206	A Bartender's Guide to Nonalcoholic Beverages
PH210	You Can Help Prevent Alcohol-Impaired Driving
PH212	NTSB Safety Study (1984)
PH215	Youth and Highway Safety
PH217	Life of the Party Pack
RP0403	AH&RW Thematic Section: Drinking and Driving (Fall 1982)
RP0407	Facts for Planning: Youth, Drinking, and Driving (Winter 1982)
RP0422	DWI Update (AH&RW, 1983-1985)
RP0528	Youth, Alcohol, and Traffic Accidents (Alcohol and Health Monograph No. 4: Special Population Issues)
RP0530	Epidemiologic Bulletin 3: Differences in Alcohol Involvement in Fatal Motor Vehicle Accidents Related to Age of Drivers
MS219	Introduction to NCALI

College Alcohol Survey

(continued from page 48)

subject of alcohol problems during the campus orientation period. The prevalence of each of these activities has increased significantly during the 6-year survey period. Highly significant is the inclusion of a focused period of time (e.g., an Alcohol Awareness Week or Day) now occurring on 63 percent of the campuses. This represents a fourfold increase since 1979. Two-thirds of the colleges now send staff to attend regional, State, or national planning workshops on alcohol education. Thirty-eight percent of the colleges in the 1985 sample reported a coordinated statewide alcohol education effort, compared with 23 percent 3 years earlier.

Conclusions

A comparison of the three College Alcohol Surveys provides an opportunity to identify changes taking place on the nation's campuses with respect to alcohol issues. A review of these data suggests that there is a strong tendency for colleges and universities to institute policies and practices to prevent the abuse of alcoholic beverages. Although a growing percentage of administrators reports that campus alcohol-related problems are on the decline, most respondents reported that the rate of such problems has remained steady or increased.

However, help is available for students who experience drinking problems. Individual and group counseling is offered to students on almost all campuses, and there is a strong trend toward giving more attention to the prevention of alcohol problems.

These results demonstrate that colleges and universities are attempting to deal with alcohol abuse. Increasing numbers of campus offices and groups are involved in a greater variety of both prevention and remedial responses to alcohol abuse concerns. The trend for collegiate sensitivity and leadership with regard to this major social issue is clear. This provides support for all colleges and universities to develop further and to enhance alcohol education policies and activities. ■

This article is based on a paper presented at the annual conference of the National Council on Alcoholism, "Youth and Alcohol: Trends in Public Policy," held in Washington, DC in April 1985.
David S. Anderson, Ph.D., *is director of residence life at Ohio University, Athens, OH.* **Angelo F. Gadaleto, Ph.D.,** *is director of the counseling center, Radford University, Radford, VA.*

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SCHUCKIT, M.; GOODWIN, D.; AND WINOKUR, G. A study of alcoholism in half siblings. *American Journal of Psychiatry* 128:1132(122)-1136(126), 1972.

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THACKER, S.B.; VEECH, R.L.; VERNON, A.A.; AND RUTSTEIN, D.D. Genetics and biochemical factors relevant to alcoholism. *Alcoholism: Clinical and Experimental Research* 8:375-383, 1984.

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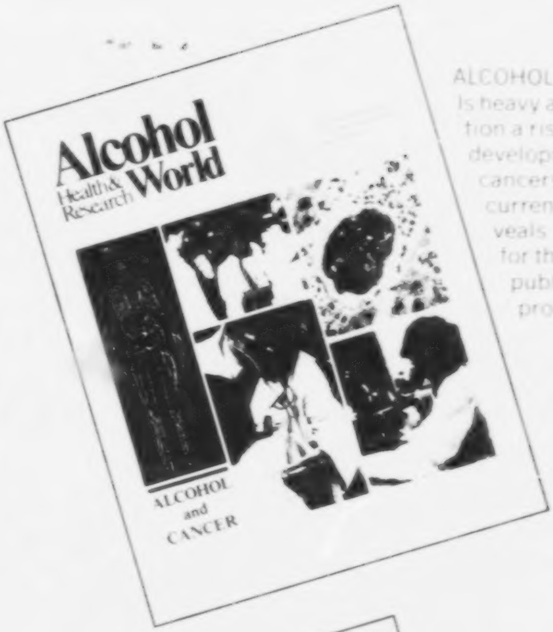

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MINORITIES

What does the latest research show about the drinking patterns and practices of minority Americans? What is the economic toll exacted? What are the implications for health and prevention? Read what the experts are saying and doing about the drinking practices and problems of black, Hispanic, Native and Asian Americans.

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From the Editor

"Beer makes him cease being a man. It causes your soul to wander, and you are like a crooked steering-oar in a boat that obeys on neither side. . . ."
(Anastasi Papyrus IV, ca. 1500 B.C.)

The first episodes of human drunkenness are forever lost in prehistory, but no doubt our ancestors quickly noted that they did many things less well drunk than sober—and that some of those things were thereby made more dangerous. Early historical writings, such as the above admonition from an Egyptian teacher to his pupil, reiterated the lesson. The analogy used here suggests that even the ancients saw a relationship between excessive drinking and out-of-control vehicles.

If cautions against drunkenness are ancient, so is the debate over what ought to be done about it. Other old Egyptian writings mention various solutions: the invocation of religious taboos, the levying of taxes, and the establishment of houses for the care of those "made mad by beer and wine." These are all measures with contemporary parallels.

But there is apparently no recorded commentary on the obligations to guests or community of those who serve alcoholic beverages. The concern for servers' responsibilities, as one part of the search for ways of limiting the harm caused by alcohol abuse, seems largely to be a phenomenon of our times. Certainly interest in these issues has intensified in recent years, and much social, legal, legislative, and educational activity has followed.

The interest in responsible serving practices stems from at least two sources. First, many observers have expressed concern over the changing standards of legal liability in the United States. The availability of liability insurance in general is affected by these changes, and both social hosts and the hospitality industry may find that responsible serving practices can play a role in obtaining and keeping cost-effective insurance.

The second source of interest in these practices is their potential for preventing alcohol-related problems, and the articles in the following pages are unified by that theme.

—Thomas Prugh
Special Focus Editor

Alcohol
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Alcohol Health and Research World (ISSN 0090-838X) is a quarterly produced by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) through the National Clearinghouse for Alcohol Information, operated under contract number ADM 281–84–0005 by InterAmerica Research Associates. Terry Freeman is the Project Officer for the Clearinghouse. The Secretary of Health and Human Services has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through September 30, 1986. Opinions expressed in contributed articles do not necessarily reflect the views of NIAAA. The U.S. Government does not endorse or favor any specific commercial product or commodity. Trade or proprietary names appearing in this publication are used only because they are considered essential in the context of the studies reported herein. Manuscripts concerning research, treatment, or prevention of alcoholism and alcohol problems are solicited and should be sent to the Editor, *Alcohol Health and Research World*, P.O. Box 2345, Rockville, Maryland 20852. Subscriptions and changes of address should be sent to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscriptions are $12.00 a year or $15.00 if mailed to a foreign address. Single copies are available at $3.25 ($4.06 to a foreign address). These prices are subject to change without notice. Unless otherwise noted in the text, all material appearing in this magazine is in the public domain and may be reproduced or copied without permission. Citation of the source is appreciated.

The editors of *AH&RW* are grateful to the management of the Professional Bartenders School, Bartenders Academy, and Courts Royal for permitting us to photograph their staff and facilities.

SERVERS AND HOSTS CAN MAKE A DIFFERENCE

In recent years, millions of Americans have become more health-conscious and have adopted lifestyles that acknowledge the value of exercise, stress-reduction, and sound diet in creating and maintaining rich and fulfilling lives. Trends in alcohol use mirror this development, as many people now choose to drink more moderately or not at all. Changing social attitudes are also reflected in the increasing popularity of alternative nonalcoholic beverages.

But these changes are not confined to the personal: They extend into the social realm as well. Public awareness of the social impact of alcohol problems is at an all-time peak. A good illustration of this is the rise of grassroots citizens' organizations devoted to combating the problem of drunk and drugged drivers. The vitality of such organizations represents an unprecedented level of public commitment to the reduction of needless alcohol-related deaths and injuries.

The current interest in server responsibility is another example. Server responsibility is not a new idea—it is rooted in a history of dram shop (an old English term for tavern) laws that goes back many years in the United States. These laws have held servers liable, in some circumstances, for the actions of intoxicated patrons or guests. Further, recent court decisions and renewed legislative activity concerning dram shop laws highlight the fact that servers and hosts can make a difference through decisions about what to serve, how to entertain, and how to arrange the setting. The increased media and legal attention recently focused on this subject has served to point out its complexity, and many questions remain unresolved.

The National Institute on Alcohol Abuse and Alcoholism is sponsoring pertinent research in this area, disseminating the findings, and working with a wide variety of other organizations and agencies with an interest in this important public health issue. One step in the dissemination of these research findings is the publication of this issue of *Alcohol Health and Research World*, with its special focus on server responsibility. It contains reports on three federally supported research projects relating to server responsibility (two of them the work of NIAAA grantees); a Perspectives article wherein representatives from the worlds of law, business, consumer advocacy, and the alcohol problems field express their opinions on these recent trends; and a wealth of related material.

Loran D Archer

LORAN D. ARCHER
Acting Director, NIAAA

Alcohol
Health & Research World

SPECIAL FOCUS

Server Responsibility

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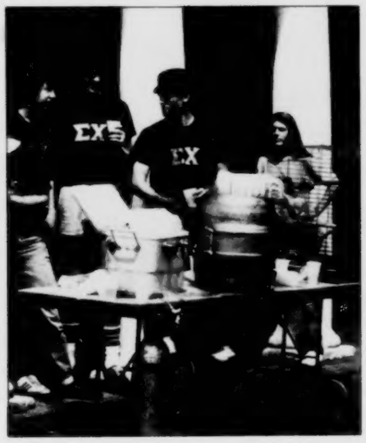
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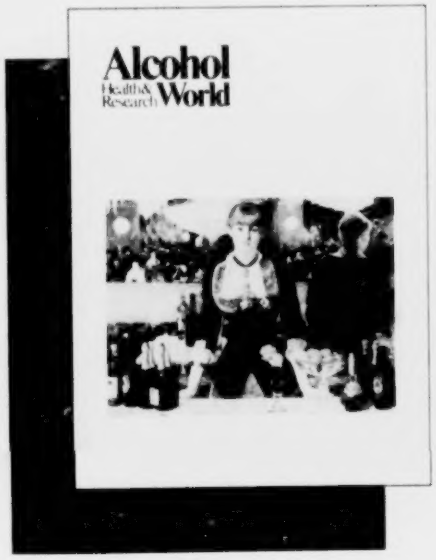
ABOUT THE COVER

Art critics have called Edouard Manet's *Bar at the Folies-Bergère* a masterpiece of optical sensations. Completed in 1882, the painting depicts the entire barroom scene as a huge still life in which the barmaid, the customers, the bowl of fruit, and glittering bottles express the motif. Such a portrayal of human subjects as impersonal, expressionless shapes represents a radical break with tradition. In this arrested moment, under the glow of the glass globes, the blank-faced barmaid appears ready to serve unquestioningly any and all patrons.

The image on the cover thus serves as a counterpoint to the subject matter discussed in the pages that follow, for today's servers of alcoholic beverages cannot afford to be as impassive.

The *Bar at the Folies-Bergère* appears with permission from the Courtauld Institute Galleries, London.



Alcohol Health& Research World

Prevention Research

The Model Dram Shop Act of 1985

JAMES F. MOSHER, J.D.
VICTOR J. COLMAN, J.D.

Recent research regarding the prevention of alcohol-related problems has stressed the need to examine the social, economic, and physical environments where drinking takes place. Alcohol prices, the minimum age of purchase, and many other aspects of alcohol availability have been shown to affect individual drinking behavior, including that of persons who exhibit serious alcohol-related problems.

Reshaping drinking environments is a complicated process, however; and frequently entails the careful consideration and understanding of legal and regulatory mechanisms available at Federal, State, and local levels. This raises extremely difficult issues for the researcher and the policymaker. The legal system in the United States tends to be insulated from study, and its operations may appear incomprehensible to those not specially trained. As a result, prevention strategies often take existing legal structures as a given and attempt to operate within what can be very severe restraints. The legal system, meanwhile, tends to operate without regard to the profound influence it can have on social policy and social problems.

The research described in this article, which examines the potential use of dram shop law as a tool for preventing alcohol-related problems, is an explicit effort to address these problems. The article is divided into six parts. The first section provides an overview of dram shop liability and its current status in the United States. The second and third describe the design and the findings of the legal research project that led to the drafting of the Model Alcoholic Beverage Retail Licensee Liability Act of 1985 ("Model Act"). The major provisions and purposes of the Model Act are discussed in the fourth section (see sidebar for the complete text). The Model Act's present legislative status is described in the fifth section. The article concludes with a discussion of future agendas.

Dram Shop Liability: An Overview

"Dram shop liability" refers to the civil liability of those who furnish alcoholic beverages to minors or to those who are "visibly" or "obviously" intoxicated. The typical factual scenario involves a patron who is served past the point of obvious or apparent intoxication, attempts to operate a motor vehicle, and soon after causes a crash with other vehicles. The innocent victim may be able to recover damages not only from the intoxicated party but also from the licensed establishment that provided the alcohol.

Dram shop liability may be based on either statutory law or common law. Statutory law derives from statutes enacted by State legislatures and may take a number of forms; common law stems from judicial opinions and is based on a court's determination of the application of ordinary negligence principles to the particular factual situation involved. Thus, a judicial decision can have the same legal effect as written law.

In 24 States, dram shop statutes explicitly provide for the civil liability of those who improperly furnish alcoholic beverages. Twenty-nine States provide for common law liability, with 13 of these jurisdictions permitting liability to be based on dram shop statutes as well. Currently, 38 States have some form of dram shop liability (Colman et al. 1985).

In recent years, State courts have dramatically expanded dram shop liability based on ordinary negligence principles. Until the early 1960s, virtually no court recognized the right to sue servers for the actions of their patrons, ruling instead that, absent legislative action to the contrary, the drinker was solely responsible for his or her own actions. Today, the clear trend is to overrule this old common law principle. Servers are now held to the same standard applied to any other commercial business: If an action (in this case the serving of alcohol to a minor or to an obviously intoxicated person) creates a reasonably foreseeable risk of harm to others, then liability may be imposed (Harrington 1984; Mosher 1985).

The expansion of court-imposed liability has recently caused a move by legislatures to protect licensees. This trend stems from two major factors: the casualty insurance "crisis" and the efforts of the powerful retail alcoholic beverage industry lobby. Some licensed retailers of alcohol are unable to obtain liability insurance and are pushing their State legislatures for relief. In response to industry lobbying efforts, a small number of State legislatures is either limiting or eliminating dram shop liability (Harrington 1986). Some States have tried to attack the problem by setting up insurance pools that make liability insurance available.

Current legislative debates generally ignore the real and potential public health impact of dram shop liability (Mosher 1984*a*, 1985). The debate too often

Alexander Tucker

HERETU

Alexander Tucker

matches the alcohol beverage industry against the State trial lawyers group. The public views both groups as self-interested, with perhaps some justification. Unfortunately, it is the public that loses. Dram shop liability, if properly framed, provides an important tool for preventing alcohol-related problems. Neither of the primary lobbying groups, however, sees this public health approach as in its self-interest.

Server Intervention and the Law: Summary of a Legal Research Project

The Model Act is the major product of an 18-month research project (which ended March 1, 1985) funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). The project consisted of three separate data collection components. In Phase 1, comprehensive data on all relevant appellate court cases on dram shop liability and all relevant regulatory materials, including those relating to minimum-age drinking laws, were collected.

For the case analysis, project staff developed a unique data analysis software package that permitted rapid case searching and the breaking down of each individual case into specific key variables, which later formed the framework for the Model Act.

The statutory provisions were found primarily in three bodies of law: criminal law, civil liability law, and alcohol beverage control statutes and regulations. A model form designed by project staff for collecting legal data was used to codify the collected provisions. Each dram shop statute was evaluated in terms of coverage, clarity, extent of liability, and potential defenses. The comparison of all relevant State laws provided the drafters of the Model Act with a useful research base.

Phase 2 involved a detailed analysis of selected dram shop cases based on interviews with plaintiff and defense attorneys. Project staff concentrated on three case study sites—California, Massachusetts, and Michigan—with contrasting histories of dram shop liability laws. The interview schedule was divided into four major categories: (1) the key attributes of persons or entities being sued; (2) the server practices of the defendant establishment; (3) demographic data regarding the patron, the server, and the person(s) injured; and (4) data regarding the incident in which the injury and damage occurred. (The results are summarized in Colman 1984.)

Phase 3 involved a review of server and manager training programs. The program curricula were analyzed and divided into major subject areas and training components. The results proved to be the basis for Section 10 of the Model Act, the "Responsible Business Practices Defense," which includes a list of responsible management policies, procedures, and actions that should be stressed by the factfinder. (See Mosher, in press, for summary of the results.)

Research Findings

Six major research findings stemmed from the data analysis conducted during Phases 1, 2, and 3:

(1) Lack of a prevention focus. Courts have generally justified the imposition of dram shop liability on two grounds: It promotes the prevention of alcohol-related problems (particularly drinking and driving), and it offers a just mechanism for compensating innocent victims.

Courts have not, however, clearly analyzed these rationales. While prevention is often cited in court opinions, little attention has been given to the actual effect of the decisions on licensee behavior. Since no specific guidelines have been established for licensees to follow in order to avoid liability, they have little incentive to adopt responsible service practices and to train staff. Apparently recognizing this failure to analyze the prevention justification adequately, courts have emphasized the need to compensate victims as the primary basis for imposing liability. Others have argued that civil liability is at best an imperfect system for compensating victims. Only a small percentage of those injured by intoxicated persons will have a valid dram shop claim. Obtaining necessary evidence of a licensee's involvement is extremely difficult and the litigation process is expensive and time-consuming. If compensation is the primary goal of dram shop liability law, then clearly a much more equitable and efficient system for victims can be devised.

(2) Limited evidentiary focus. The courts' failure to analyze the purpose of dram shop liability stems in large measure from the very limited evidentiary focus found in the litigation. Data collected in both Phases 1 and 2 uncovered very few instances in which evidence of server practices and management policies were even mentioned at either the trial or appellate court level.

This lack of evidence is not surprising. Virtually all dram shop cases in the recent past have rested on whether the plaintiff could show that the drinker was "obviously intoxicated" when served, a vague standard that is difficult for a jury to apply. The lack of clear guidelines for determining negligence is a major impediment to effective use of dram shop liability as a prevention tool. Insurance companies are more likely to settle questionable claims than to litigate, particularly since juries are unlikely to be sympathetic to the commercial server. The resultant outlays are translated into the higher premiums for licensees, with little regard for which licensees are taking responsible steps to reduce the risk of negligent service. Plaintiff attorneys in turn are more likely to file claims against any licensee remotely connected to the drinking event, in the hope of obtaining easy settlements. In this climate, licensees have little incentive for reforming their serving policies and practices, concluding that they are in jeopardy of facing expensive lawsuits, whatever their prevention actions. (For further discussion see Mosher 1984*b*, *1984c*).

(3) Lack of attention to social policy issues. Court-imposed liability law is developed on a case-by-case basis, with decisions stemming from analysis of particular factual situations. For dram shop cases, this has created both confusion of purpose (discussed above) and a failure to analyze underlying social policy issues. Phase 1 research showed that each court opinion left unresolved policy issues, a situation that promotes additional litigation and uncertainty. Every new case presented attorneys with a new opportunity to argue the impact and the meaning of previous decisions. This tended to extend the litigation process, create long delays, and encourage out-of-court settlements that were not necessarily based on the particular merits of the cases. The need for clear legislative guidelines for courts to follow was distinctly indicated by the Phase 1 analysis.

(4) Poorly drafted legislation. States with dram shop statutes did not fare better than those using court-based liability, however. Existing legislation (analyzed in Phase 1) tended to be poorly drafted, with important issues left unaddressed. Vague language that promotes unnecessary litigation was often used and a prevention focus was uniformly absent.

(5) Server training promoted. Despite the flaws, Phase 3 research demonstrated that the fear of liability was nonetheless a major impetus for the development of server training programs nationwide. Most of the programs reviewed were inadequate from a prevention standpoint, being best described as "awareness" efforts that gave little or no attention to the role of management and the need for skills development among servers. (For a review of this aspect of the research see Mosher, in press.) Typically, a lecture format was used during a relatively short time period (4 hours or less), with no followup. In many instances, those leading the awareness programs had little or no experience in conducting training programs. Despite these shortcomings, dram shop liability was shown to have great potential for shaping responsible business practices, provided the laws were carefully drafted.

(6) Ordinary legal principles apply. Finally, the legal analysis showed that dram shop liability did not constitute a special category of legal negligence nor an unduly harsh standard for licensees, at least in principle. Ordinary principles of negligence law clearly applied: The defendant must be shown to have a duty to others; a foreseeable potential risk for the plaintiff must be present; and specific actions by the defendant to prevent the injury—actions that could be reasonably expected of an ordinarily prudent person in a like situation—must be shown. Refusing service to a minor or to an obviously intoxicated person who is likely to be operating a motor vehicle appears to fulfill these basic requirements of negligence law.

Thus, the principles on which dram shop liability is based are identical to those applied to any other commercial enterprise. Providing special protection from liability, which is now the case in many States, provides alcohol retailers a benefit not applicable to other businesses.

The Model Act

These findings provided the foundation for drafting the Model Act, which constituted Phase 4 of the project. An initial draft was prepared in November and December of 1984 and was disseminated to more than 100 interested parties, with an explanatory cover letter requesting comments and criticisms. More than 20 recipients responded. Their responses ranged from brief acknowledgements to detailed section-by-section critiques. The majority of respondents were attorneys, three were experts in blood chemistry, and four were government officials. One respondent each from the alcohol beverage industry and the insurance industry offered comments.

The comments proved extremely useful in identifying ambiguities and omissions. Numerous revisions were made, with particular attention given to creating a comprehensive and fair document that would promote responsible business practices among licensees. The final draft of the Model Act was completed on February 28, 1985.

Four major goals guided the drafting and revising of the Model Act. First, it is designed to make prevention the law's primary purpose. This is stated specifically in Section 2 of the Act. Compensation remains a secondary purpose, but courts are instructed to apply the provisions of the Act such that its prevention mandate is fulfilled.

The Act's second goal, a means to fulfill the first, is to direct the factfinder's primary attention to the defendant's business practices. Defining the intoxication of the patron necessarily remains a central issue, but the jury is also provided a means to evaluate the manner in which the defendant's establishment is operated and the extent to which it meets current industry and community standards. This evidence can be central to the jury's determination of whether the defendant should have recognized the patron's intoxication (or age, in the case of serving minors).

Section 10 of the Act, the Responsible Business Practices Defense, was drafted to fulfill this second goal. Its nonexhaustive list of business practices to be considered by the jury includes: (1) the adequacy and training of the licensee's staff; (2) the existence of written policies regarding the sale of alcoholic beverages; (3) the existence of standardized hiring and reprimand policies; (4) the availability of alternative safe transportation; (5) the availability of food and nonalcoholic beverages; and (6) the extent of cooperation between the licensee and the surrounding community in the prevention effort. Also included are guidelines for evaluating the effectiveness of a licensee's age identification checking system. Section 10 provides positive benefits to a licensee who can establish the existence of responsible business practices, but it can adversely affect the licensee's defense if the plaintiff can show that the licensee failed to meet these minimum standards. Licensees thus have strong incentive to adopt the reforms now being developed in a variety of server intervention programs.

A third goal of the Model Act is to provide more certainty and clarity in the law. All major aspects of dram shop legislation were identified during the research phases of the project, and specific legal provisions were drafted to address major issues that led to uncertainty and repeated litigation. The research focus of the project allowed project staff to pay careful attention to detail, and the extensive analysis provided by outside reviewers proved to be invaluable. This process contrasts sharply with the drafting of most current dram shop legislation, which often has been hastily undertaken in response to the urgent demands of powerful lobbies and has been carried out with insufficient attention to key issues. The enactment of the Model Act should thus help to avoid the disadvantages of the case-by-case determination of social policy issues that characterizes current practice.

Finally, the Model Act is designed as a neutral document that can serve as a resource tool for decisionmaking rather than as an advocacy tool. Several aspects of dram shop liability law raise issues that are best resolved through the political process. In such cases, the Act provides commentary on possible options and provides a format for legislative resolution. The Act recognizes that States may wish to take differing approaches based on individual legislative analyses of each political jurisdiction's needs, problems and resources.

Experience since the Act's completion has demonstrated its utility in this regard. It has been used as a resource by many partisan groups involved in the dram shop debate, although neither the trial lawyers nor the retail beverage industry has endorsed it. Policymakers have been particularly interested in studying its provisions and commentaries, and numerous task forces and public policy groups have recommended its enactment.

Current Status of the Model Act

Since the final draft of the Model Act was completed, it has been widely disseminated and has received nationwide attention. More importantly, the Model Act has been introduced, in whole or in part, in several State legislatures, and is being actively considered in many other States as well. Table 1 provides an overview of the Act's current status in the various States now considering its enactment.

Conclusion

Dram shop liability is a case study of the current failure of the legal community to respond to and understand developments in social policy and research. The dram shop liability research project demonstrated the need for comprehensive and careful research on the laws and regulations which affect the prevention of alcohol-related problems. The project was able to increase communication among those in the legal process, those involved in prevention, and the retail alcoholic beverage industry. Its analysis provided a basis for establishing carefully drafted model legislation that is flexible and based on sound legal principles.

Much remains to be accomplished if the Model Act is to be successful in reducing alcohol-related problems, however. Most importantly, specific guidelines need to be established and agreed upon by all interested parties regarding the nature and content of responsible business practices. A process must also be established for continuously updating standards. The active support of local communities and State agencies is critical for the realization of this goal. To

Table 1 Jurisdictional Breakdown of Current Legislative Activity

States across the country have shown wide and varied levels of interest in the Model Act since its completion in March 1985. The attention given has ranged from a general inquiry into the act's provisions to legislative introduction of the entire law.

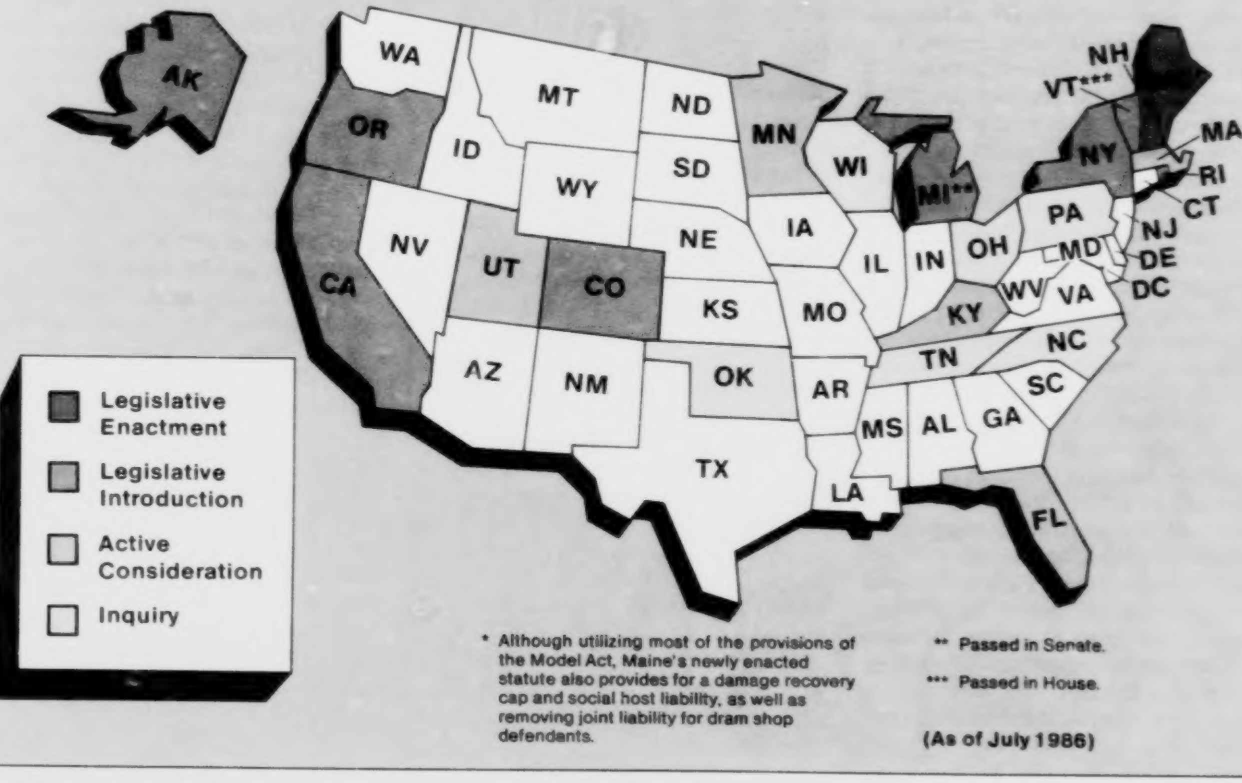
Table 1 groups States into three categories depending on their level of interest. The categories are defined below:

Legislative Enactment This will include States that have enacted laws that are derived from any portion of the Model Act.

Legislative Introduction This category includes States that have introduced into the State legislature the entire Model Act or major sections of it, either verbatim or in modified form.

Active Consideration While they have not yet introduced the Model Act, the States in this category have actively considered the act, as expressed by one or several of the following: placing it under review by their State legislative office, research service, or drunk-driving commission or task force; recommending the act to their State legislature (by key constituency groups or legislative service); and extending invitations to project staff to speak and/or lead discussions about the Model Act or State legislative committee hearings.

Inquiry This category includes those States in which an interested party or group (e.g., a legislator, attorney, constituency group or State department or commission), has requested information on or a copy of the Model Act, and has expressed interest in having it actively considered at the State level.



* Although utilizing most of the provisions of the Model Act, Maine's newly enacted statute also provides for a damage recovery cap and social host liability, as well as removing joint liability for dram shop defendants.

** Passed in Senate.

*** Passed in House.

(As of July 1986)

be successful, server intervention programs must respond to the problems and needs of the surrounding community. This can only occur if local constituencies become active in the process of development and implementation. Local and State resources may be critical; community colleges or adult schools, for example, may provide an ideal setting for establishing training programs. Local ordinances and statewide regulations and laws will also be necessary to codify agreed-upon standards of conduct. Mandatory server training provisions (already in existence in Oregon) may also be needed, with complementary legislation to fund program development and evaluation.

While the process is complex and filled with obstacles, the goal is clearly attainable. Server intervention, with supporting dram shop legislation, is a practical prevention strategy that can reduce the incidence of impaired driving and other alcohol-related problems. It also provides a means to increase public awareness of the responsibility of servers, both private and commercial, to serve alcohol responsibly, and of the need for a focused prevention effort.■

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(see page 35 for references)

Model Alcoholic Beverage Retail Licensee Liability Act of 1985

***Editor's Note:** This model act is reprinted from the text supplied by the authors and is the result of work carried out by staff members of the Prevention Research Group of the Medical Research Institute of San Francisco, 2532 Durant Ave., Berkeley, CA 94704. The work was supported by the National Institute on Alcohol Abuse and Alcoholism. Complete commentaries on the act have been published in* Western State University Law Review 12:442-517, 1985.

SECTION 1: SHORT TITLE

This Act shall be entitled [State] Alcoholic Beverage Retail Licensee Liability Act of [year].

SECTION 2: PURPOSE

(a) The primary legislative purpose of the Act is to prevent intoxication-related traumatic injuries, deaths and other damages, as specified in Section 8, among [State's] population.

(b) The secondary legislative purpose is to establish a legal basis for obtaining compensation to those suffering damages as a result of intoxication-related incidents in accordance with the provisions of this Act.

SECTION 3: DEFINITIONS

(a) *Adult* means any person of legal age to purchase alcoholic beverages, as defined by [State statutory provision].

(b) *Alcoholic beverages* means [definition used in State Alcoholic Beverage Control (ABC) Act].

(c) *Intoxicated person* means an individual who is in a state of intoxication as defined by this Act.

(d) *Intoxication* means an impairment of a person's mental or physical faculties as a result of drug or alcoholic beverage use so as to diminish that person's ability to think and act in a manner in which an ordinary prudent and cautious person, in full possession of his or her faculties and using reasonable care, would act under like circumstances.

(e) *Licensee* means any person who is required to be licensed to serve alcoholic beverages [including any governmental entity permitted by law to serve alcoholic beverages] pursuant to [State ABC Act].

(f) *Minor* means any person under the legal age to purchase alcoholic beverages as defined by [State statutory provision].

(g) *Person* means any individual, governmental body, corporation or other legal entity.

(h) *Premises* means [definition used in State ABC act].

(i) *Service of Alcoholic Beverage; Service* means any sale, gift or other furnishing of alcoholic beverages.

SECTION 4: PLAINTIFF

(a) Any person who suffers damage, as provided in Section 8, may bring an action pursuant to this Act subject to the limitation found in subsection (b) of this Section

(b) A [person/adult] who becomes intoxicated may not bring an action pursuant to Section 6 of this Act (negligent service of alcoholic beverages) against a defendant for serving alcoholic beverages to such person.

SECTION 5: DEFENDANTS

The following persons who commit an act giving rise to liability, as provided in Section 6 and 7, may be made a defendant to a claim under the provisions of this Act:

(a) an alcoholic beverage retail licensee, and any employee or agent of such a licensee;

(b) any person who, at the time of such act, was required by law to have had an alcoholic beverage retail license under the provisions of [State ABC Act], and any employee or agent of such person.

SECTION 6: NEGLIGENT SERVICE OF ALCOHOLIC BEVERAGES

(a) A defendant, as defined in Section 5, who negligently serves alcoholic beverages to a minor or to an intoxicated person is liable for resulting damages, subject to the provisions of this Act.

(b) Service of alcoholic beverages to a minor or to an intoxicated person is negligent if the defendant knows or if a reasonably prudent person in like circumstances adhering to responsible business practices as defined in Section 10 would know that the person being served is a minor or is intoxicated.

(c) Proof of service of alcoholic beverages to a minor without request for identification shall form a rebuttable presumption of negligence.

(d) Service of alcoholic beverages by a defendant to an adult person who

(continued on next page)

subsequently serves a minor off the premises [or who is legally permitted to serve a minor] does not constitute service to the minor unless a reasonably prudent person in like circumstances would know that such subsequent service is reasonably likely to occur [and is illegal].

(e) A defendant does not have a duty to investigate whether a person being served alcoholic beverages intends to serve the alcoholic beverages to other persons off the premises.

(f) A defendant is not chargeable with knowledge of a person's consumption of alcoholic beverages or other drugs off the defendant's premises unless the person's appearance and behavior, or other facts known to defendant, would put a reasonably prudent person on notice of such consumption.

(g) A defendant is not under a duty to recognize signs of a person's intoxication other than those normally associated with the consumption of alcoholic beverages except for intoxication resulting in whole or in part from other drugs consumed on defendant's premises with defendant's actual or constructive knowledge.

SECTION 7: RECKLESS SERVICE OF ALCOHOLIC BEVERAGES

(a) The service of alcoholic beverages is reckless when a defendant, as defined in Section 5, intentionally serves alcoholic beverages to a person when the server knows, or a reasonable person in his position should have known, that such service creates an unreasonable risk of physical harm to the drinker or to others that is substantially greater than that which is necessary to make his conduct negligent.

(b) A defendant who recklessly provides alcoholic beverages to another is liable for resulting damages.

(c) Specific serving practices that are admissible as evidence of reckless conduct include, but are not limited to, the following:

(1) Active encouragement of intoxicated persons to consume substantial amounts of alcoholic beverages;

(2) Service of alcoholic beverages to a person, sixteen years old or under, when the server has actual or constructive knowledge of the patron's age;

(3) Service of alcoholic beverages to a patron that is so continuous and excessive that it creates a substantial risk of death by alcohol poisoning;

(4) The active assistance by a defendant of a patron into a motor vehicle when the patron is so intoxicated that such assistance is required and the defendant knows or should know that the intoxicated person intends to operate the motor vehicle.

SECTION 8: DAMAGES

(a) Damages may be awarded for all injuries recognized under [State] common law (or codified common law provisions).

(b) Punitive damages may be awarded in all actions based on reckless conduct, as defined in Section 7. Punitive damages may not be awarded for actions based on negligent conduct, as defined in Section 6.

(c) Damages may be recovered under [wrongful death statute] and [survival statute] as in other tort actions.

SECTION 9: COMMON LAW DEFENSES

Defenses applicable to tort actions based on negligence and recklessness in [State] may be asserted in defending actions brought pursuant to this Act.

SECTION 10: RESPONSIBLE BUSINESS PRACTICES DEFENSE

(a) A defendant's service of alcoholic beverages is not negligent or reckless if the defendant, at the time of the service, is adhering to responsible business practices. Responsible business practices are those business policies, procedures and actions which an ordinarily prudent person would follow in like circumstances.

(b) The service of alcoholic beverages to a person with actual or constructive knowledge that such person is intoxicated or a minor constitutes an unreasonable business practice. Evidence of responsible business practices pursuant to this section is relevant to determining whether a defendant who does not have actual knowledge should have known of the person's intoxicated condition or age.

(c) Evidence of responsible business practices may include, but is not limited to, comprehensive training of defendant and defendant's employees and agents who are present at the time of service of alcoholic beverages and responsible management policies, procedures and actions which are in effect at the time of such service.

(d) For the purposes of service to intoxicated persons, evidence of comprehensive training includes, but is not limited to, the development of knowledge and skills regarding the responsible service of alcoholic beverages and the handling of intoxicated persons. Such training shall be appropriate to the level, kind, and type of responsibility for each employee and agent to be trained.

(e) For the purposes of service to intoxicated persons, evidence of responsible management policies, procedures, and actions may include, but is not limited to, those policies, procedures and actions which are implemented at time of service and which:

(1) encourage persons not to become intoxicated if they consume alcoholic beverages on the defendant's premises;

(2) promote availability of nonalcoholic beverages and food;

(3) promote safe transportation alternatives other than driving while intoxicated;

(4) prohibit employees and agents of defendant from consuming alcoholic beverages while acting in their capacity as employee or agent;

(5) establish promotions and marketing efforts which publicize responsible business practices to the defendant's customers and community;

(6) implement comprehensive training procedures; and

(7) maintain an adequate, trained number of employees and agents for the type and size of defendant's business;

(8) are written in a policy and procedures handbook, or similar format and made available to employees;

(9) establish a standardized method for hiring qualified employees;

(10) reprimand employees who violate employer policies and procedures.

(f) For the purposes of service to minors, evidence of responsible business practices may include, but is not limited to those listed in subsection (e) and the following:

(1) management policies which are implemented at the time of service and which insure the examination of proof of identification [as established by State law] for all persons seeking service of alcoholic beverages who may reasonably be suspected to be minors;

(2) comprehensive training of employees who are responsible for such examination regarding the detection of false or altered identification.

(g) Proof of responsible business practices shall be based on the totality of the circumstances, including but not limited to: the availability of training programs and alternative public transportation; the defendant's type and size of business; and the defendant's previous contacts with the intoxicated person or minor who is served. Proof of the existence or omission of one or more elements of responsible business practices does not constitute the proof or disproof of the responsible business practices defense.

SECTION 11: STATUTE OF LIMITATIONS

Any action under this Act against a defendant alleging negligent conduct shall be brought within ___ year(s) of the conduct complained of. Any action under this Act against a defendant alleging reckless conduct shall be brought within ___ year(s) of the conduct complained of.

SECTION 12: PRIVILEGES

(a) No defendant, as provided in Section 5, may be held civilly liable for damages resulting from a good faith refusal to serve alcoholic beverages to any person who:

(1) fails to show proper identification of age; or

(2) reasonably appears to be a minor; or

(3) is refused service of alcoholic beverages by defendant in a good faith effort to prevent excessive consumption of alcohol by a person.

(b) No defendant, as provided in Section 5, may be held civilly liable for holding a person's identification document presented to defendant as proof of the person's age for the purposes of receiving alcoholic beverages provided:

(1) such holding is for a reasonable length of time in a good faith effort to determine whether the person is of legal age or to summon law enforcement officers; and

(2) the person whose identification is being held is informed of the reason for defendant's action.

(c) No defendant, as provided in Section 5, may be held civilly liable for using reasonable force to detain for a reasonable period of time necessary to summon law enforcement officers a person who, in the defendant's presence, is committing or has committed a breach of the peace or felony or is attempting to operate a motor vehicle while intoxicated.

(d) This section does not limit a defendant's right to assert any other defense to a civil liability claim otherwise provided by law.

SECTION 13: SETTLEMENT; RELEASE; CONTRIBUTION; INDEMNITY

(a) A plaintiff's settlement and proper release of either the intoxicated tortfeasor or a defendant, as defined in Section 5, will not bar potential claims against any other defendant(s).

(b) The amount paid to a plaintiff in consideration for the settlement and proper release of any defendant will be offset against all other subsequent judgments received by plaintiff.

(c) The liability of the intoxicated tortfeasor and any defendant, as defined in Section 5, who served alcoholic beverages, shall be joint and several.

(d) In cases of negligent conduct, the liability of intoxicated tortfeasor and any defendant, as defined in Section 5, who served alcoholic beverages shall have a right of contribution and not a right of indemnification.

(e) In cases of reckless conduct, nonreckless defendants have a right of either indemnification or contribution from any reckless defendants.

SECTION 14: EXCLUSIVE REMEDY

This Act is the exclusive remedy against defendants, as defined in Section 5, for claims by those suffering damages based on the defendants' service of alcoholic beverages.

SECTION 15: EVALUATION

The Alcoholic Beverage Control Agency shall conduct an evaluation of the impact of this Act, to be completed within two years of its enactment. Evaluation topics to be addressed include but are not limited to initiation of, extent of, or changes in:

(1) the number and type of server and manager training programs in the State;

(2) the curricula of such programs;

(3) the management policies, procedures and actions of licensees regarding the service of alcoholic beverages;

(4) the number of actions filed, settled, and litigated pursuant to the Act and the number and amounts of recoveries;

(5) the number of successful defenses based on Section 10 of this Act;

(6) the legal interpretations of the provisions of this Act, particularly as compared to other State court interpretations;

(7) the incidence of driving while intoxicated offenses, injuries and deaths;

(8) the incidence of other alcohol-related problems;

(9) the incidence of sales to minors and intoxicated persons.

SECTION 16: OPTIONAL NOTICE PROVISION—NOTICE TO DEFENDANT

Every plaintiff seeking damages under this Act shall give written notice to all defendants within 120 days of the date of entering an attorney-client relationship for the purpose of pursuing a claim under this Act. In the case of claims for contributions and indemnity, notice shall be given within 120 days of receiving written notice under this Act. The notice shall specify the time, place and circumstances of the defendant's conduct complained of, and the time, place and circumstances of any resulting damages. No error or omission in the notice shall void the effect of the notice, if otherwise valid, unless the error or omission is of substantially material nature. Failure to give written notice within the time specified shall be grounds for dismissal of a claim, and may only be waived by the court upon a showing of exceptional circumstances. Actual notice of sufficient facts to reasonably put a defendant on notice of a possible claim shall be construed to comply with the notice requirement herein. ■

Server Intervention

Will It Work?

Robert F. Saltz, Ph.D.

This decade has seen a leap in the public's concern over the number of lives lost in alcohol-related automobile crashes. Not surprisingly, this concern was focused first on law enforcement and the criminal courts and on the promotion of various public education campaigns targeted at drinking drivers.

At the same time, liability lawyers began to bring the issue into civil courts using so-called dram shop (liquor liability) laws that hold licensed servers of alcoholic beverages liable for damages resulting from service to minors or to intoxicated patrons. Victims of alcohol-related crashes were sometimes able to gain compensation through the courts by bringing suit against the licensed establishment that served the driver at fault, providing the victim could prove that the driver had been served alcohol even after reaching the point of intoxication. Before long, policymakers and prevention specialists began to realize that the existence of such liabilities could help them develop a new and unique strategy for reducing the rate of alcohol-related injuries and fatalities, a strategy that has come to be called server intervention.

Server intervention actually refers to a broad set of strategies for creating safer drinking environments by reducing the risk of intoxication and the risk that intoxicated patrons will harm themselves or others. It is a unique approach to prevention because it aims to modify the drinking context, a context that often presents strong inducements toward unsafe practices.

Server intervention comprises efforts at three levels: the legal environment, the community environment, and the environment of a given licensed establishment.

The specific features of server intervention are still evolving. Early work in the field was conducted by James Mosher, who, in addition to providing a conceptual framework for server intervention, has also been particularly active in analyzing the merits and deficiencies of current liquor liability laws (see Colman et al. 1985; Mosher 1979, 1983, 1984*a*, 1984*b*, 1984*c*).

A comprehensive conceptual overview has been presented elsewhere (Saltz 1985). Here, I note briefly that server intervention comprises efforts at three levels: the legal environment, the community environment, and the environment of a given licensed establishment. The legal environment includes alcohol beverage control (ABC) codes, criminal statutes, and dram shop laws. The community environment includes the use of local planning and zoning ordinances to control the types and density of retail outlets (see Wittman 1982, 1983).

Server intervention is probably most closely identified with modifying the policies and practices (and possibly the physical characteristics) of the establishment itself, as well as with training employees to implement those policies. The earliest forms of server intervention, in fact, concentrated almost exclusively on server training, with emphasis on ways of identifying minors and intoxicated patrons and on methods for cutting off service to intoxicated customers.

As experience with server training has grown, the importance of assessing and developing management policies has been recognized as well. In addition to training staff, the manager must also be responsible for evaluating the availability of food and nonalcoholic beverages, the availability of transportation for intoxicated customers, and the adequacy of staffing levels.

The training remains a necessary element because the servers must not only learn a new set of skills but must also redefine their relationship to the customer, understand the program goals, modify their attitudes about alcohol, and overcome any fears they may have about their new duties.

The evaluation described in this paper was limited to assessing server intervention at the establishment level. A comprehensive program—comprising changes in policies, procedures, and duties, along with 18 hours of staff training—was developed for a specific establishment with the aim of evaluating its impact on intoxication, consumption, and the establishment's performance as a business.

In the remainder of this paper, I will describe the intervention and comparison sites and how they were chosen, describe the server intervention program (both

Initial research results suggest that server intervention training may be a viable strategy for preventing customers fron drinking to intoxication.

policies and training), discuss the evaluation design, and conclude with a very brief look at preliminary results.

Selecting An Evaluation Site

Our criteria for selecting a likely site for evaluating server intervention included the following: First, given the experimental and mildly controversial nature of server intervention programs at the time, we wanted to begin our search at locations that might have some special reason to be concerned for the welfare of their customers. Second, we wanted a site where drinking was heavy enough to be able to show an impact if it were possible to do so. Third, we hoped to find a site that might allow more than the usually limited measures of effects on customers. Finally, we wanted to find a site where the special needs of evaluation research were sympathetically understood.

Our attention was thus directed toward institutional settings. We assumed that organizations with interests larger than making money from the sale of alcohol would be likely to support the program and would be relatively tolerant of research requirements. Our decision to seek the cooperation of the U.S. Navy was based on these criteria and on the knowledge that the Navy is particularly interested in ways to reduce the loss of life caused by driving under the influence (DUI).

Naval bases typically make alcoholic beverages available at several sites. Depending on the size of the base, there may be a package store, a bowling alley, and a golf course clubhouse, as well as a Navy club for each of three levels of Navy personnel (officers, chief petty officers, and enlisted personnel). These clubs are usually managed by civilians under Navy supervision. They typically employ civilians and some off-duty military personnel. We chose to look more closely at the enlisted clubs since, at the time our study began, they allowed all military personnel to drink 3.2 percent alcohol beer regardless of the State minimum drinking age law (which, in California, required drinkers to be 21 years old).

The Navy enlisted club had several advantages for the study. Its customers were from 18 to 25 years of age and likely to be moderate to heavy drinkers. Because customers were likely to come from a well-defined community (both socially and geographically), we could possibly collect data on a variety of events that would not otherwise be available, such as onbase DUI arrests, fights, acts of vandalism, and other events related to intoxication. At the same time, we discovered that the clubs are by no means "artificial" businesses: They depend on their revenue to keep their staffs employed and also are under intense pressure to generate income that the local base can use to support recreational activities. Because alcoholic beverage sales represent a large proportion of the clubs' revenue and also have the highest profit margin, Navy club managers are just as concerned as commercial managers would be with how server intervention might affect profitability.

The next step was to select a specific club to approach for cooperation. Our search was limited to 25 naval bases on the Pacific coast. Financial data on club operations were collected to identify clubs that were structurally typical or atypical as judged by their operational characteristics. We wanted especially to avoid clubs that were particularly different from others, since that might be indicative of some eccentric characteristics that could either create unusual problems for implementation or threaten the generalizability of our evaluation.

Assessment and modification of establishment operating policies are absolutely essential to a successful server intervention program.

We next conducted structured, face-to-face interviews with 12 managers of the more typical enlisted clubs. By this time, we were looking for management receptivity to server intervention; a measure (by self-report) of the current level of alcohol-related problems in the club; the manager's description of club customers; and general information regarding the club's operations, staffing, performance, and future. Through these interviews, we were able to identify a club that optimized the various quantitative and qualitative features we had been looking for. The manager of the chosen site, after receiving our proposal, gained approval from the base commanding officer and agreed to participate in the program and its evaluation.

We then selected a comparison site, where data would be collected but no program would be implemented, that had appropriate "proximity" to the evaluation site. The proximity was based both on the data on club characteristics and geographic nearness of the two sites.

The club at which the program was implemented employs a staff of approximately 50 who have direct contact with customers as well as another dozen or so who fulfill administrative and support functions. The staff includes bartenders, cocktail waitresses, barbacks, security (floorwalkers and doorpersons), food line staff, and duty managers. On its busiest nights (usually Fridays), the club may serve as many as 800 customers and sell over $3,000 worth of alcoholic beverages. For the fiscal year ending in September 1985, the club's sales in alcoholic beverages and food were $556,000 and $200,000, respectively.

Developing Policy at the Establishment Level

As stated earlier, assessment and modification of establishment operating policies are absolutely essential to a successful server intervention program. These policies are derived from two primary sources: a clear statement of goals for the server intervention program and onsite evaluation of preprogram practices and customer behavior relevant to those goals and to the financial well-being of the establishment. Effective policies result from blending well-articulated program goals with opportunities and constraints that become apparent through direct onsite review of operations.

Program goals are perhaps the most generic and easily transported of server intervention components. Even they, however, may require modification in a specific application. We developed the following major goals:

- Reduce the risk of intoxication.
- Reduce the risk of customers driving while intoxicated.
- Reduce the risk of underage drinking.
- Improve staff morale and functioning.
- Maintain profitability.
- Develop good community relations.

Before these general goals could be translated into concrete policies, the manager and the program developer first had to assess the current policies, operations, and staff and customer behavior in light of the goals in order to determine the specific needs of the club and to identify promising avenues of implementation. A discussion of this kind of onsite assessment, together with examples of specific observations, can be found in the overview article (Saltz 1985).

Once the goals were articulated and the site had been evaluated, it was then possible to develop specific policies, procedures, and job duties to translate the goals into concrete actions. It is not possible to anticipate specific policy requirements for all establishments, but we can provide some examples from the specific site where we conducted the evaluation.

Reduce Intoxication

Policy 1: The club will promote responsible drinking through pricing, promotion, and general practice.

1.1 Nonalcoholic beverages will be available at all price points existing for alcoholic beverages.

1.2 Club will remain open for 1 hour after bar sales stop.

1.3 Beer will not be sold in pitchers, but only in large and small glasses or mugs.

1.4 Customers may order only one drink at a time (though it may be a double).

Policy 2: No customer will be served enough alcoholic beverages to reach a point of intoxication.

2.1 Servers will determine the customers' level of intoxication through either (a) behavioral clues, or (b) actual consumption.

2.2 Servers will refuse service of alcoholic beverages to a customer judged likely to be intoxicated.

2.3 Servers will be assigned to specific sections so that customers' drinking can be monitored.

Reduce the Likelihood of Customers' Driving While Intoxicated

Policy 3: The club will intervene to prevent any intoxicated customer from driving.

3.1 The club will determine the need for alternative transportation and arrange for same.

3.2 If no safe means of transportation is available, the club will arrange for overnight accommodations.

Reduce the Risk of Underaged Drinking

Policy 4: No underaged person will be permitted to drink an alcoholic beverage.

Improve Staff Morale and Functioning

Policy 5: Club will encourage food staff performance through training, incentives, and recognition. Staff meetings will be held on a monthly basis.

Maintain Club Profitability

Policy 6: Food will be available during all business hours.

Develop Good Community Relations

Policy 7: Club manager will be responsible for keeping the surrounding community informed of club policies and activities, and for developing support for them.

Of course, each of these policies included specific operational procedures. For example, Policy 5 (improve morale), included organizing servers and security personnel into working "teams" to encourage communication and to support servers in their intervention, and Policy 6 (maintain profitability) included raising drink prices by a marginal amount and adding nonalcoholic specialty drinks to the menu. The planning process did not end with the writing of new policies and procedures. Once the program had been implemented, the management and staff needed to experiment with some procedures to make them work. (This is an ongoing process. Management will need to monitor program effectiveness, train new staff, retrain existing staff, and be on the lookout for new strategies to incorporate into existing ones.)

Summary of Training and Training Curriculum

As policies were being developed for the club, the research staff hired a training consultant to help design a curriculum that would embody the principles of server intervention and blend them into the new policies that the club employees were going to follow. We designed the curriculum to emphasize that responsible serving practices were a part of what "good service" means. We wanted to avoid anyone thinking of the prevention theme in isolation from other aspects of professional service.

Approximately 45 employees (bartenders, waitresses, food servers, security personnel, and managers) were divided into three mixed groups of 15 each for weekly training sessions. Each session ran from 3.5 hours to just over 4 hours. Each employee was involved in five training sessions. A full-day makeup session was held for nine employees (mostly security staff) who had missed one or two of the sessions. The content of each session was as follows:

Session I. Introduction: New Roles for Servers in a Changing Club (3 hours)

The first training session introduced the goals of the training within the context of various pressures on the Navy club to provide good service, to manage a safe and responsible environment, and to maintain profitability. This session highlighted society's growing interest in preventing drunk driving, the existence of liquor liability (dram shop) laws and their importance for the club and its employees, and the club manager's commitment to changing the current practices while preserving the best features that the club had to offer. Trainees were then shown how the training fit with management policy changes, and how their own roles with regard to customer service would change as a result. The training session concluded with a very detailed exploration of what it means to provide "good service" with emphasis on observing customers, being assertive, maintaining control, and being responsive to the customer's needs.

Session II. Alcohol as a Potential Problem Issue: Its Effects on Customers (3.5 hours)

This session focused on the customers' expectations and behavior concerning alcohol. The trainees first reported on their perceptions of customers' beliefs about the purposes and consequences of drinking, the perceived level of impairment brought about by drinking, and the attitudes customers have about the club's purposes and responsibilities. The trainees then discussed their own beliefs about these topics. The focus then shifted to alcohol impairment. After trainees discussed what they noticed about impairment, a film on drinking and driving demonstrated how seriously impaired a person becomes a .10 percent blood alcohol concentration (BAC). It also showed that drinkers are usually quite mistaken when they predict their capacity

Alexander Tucker

Servers are trained to identify potential problems at each contact with the customer.

for drinking. The session concluded with a lecture on alcohol physiology that concentrated on the short-term effects of alcohol on the body and introduced the key concept of "drink size," the maximum number of drinks that a person can have "in his or her system" without going over .10 percent BAC.

For small, medium, and large men, the respective drink sizes are four, five, and six (figuring 3.2 percent beer and 1-ounce shots in this particular setting); for women drinkers, three, four, and five drinks are the limit. "Drinks in the system" is calculated by taking the total number of drinks consumed and subtracting the number of hours that the person has been drinking (since one drink is normally absorbed by the body in about 1 hour). Thus, a large male can drink eight drinks in 2 hours and still be at his drink size (eight drinks minus 2 hours equals six). The drink size serves as the criterion for limiting service of alcohol.

Session III. Identifying Potential Problems: Use of the SIRR System (4 hours)

This session concentrated on the steps needed to identify a need for intervention. SIRR stands for Size Up, Interview, Rate and Relate. SIRR was adapted from the Michigan Licensed Beverage Association's "Techniques of Alcohol Management" training program, in which the server is to engage these steps—except for interview—at each contact with the customer. "Size Up" comprises two points: the server is to assign the drink size to the customer and also look for any visible signs of intoxication. "Interview" means the server should talk to the customer in order to find out whether he or she is driving, whether the customer has had something to eat or drink already, and to look for any clues to the customer's mood and purpose for coming. "Rate" requires the server to take the information obtained from the previous steps along with the customer's drink count, and assign the customer to one of three categories: Green, Yellow, or Red (explained below, under Session IV). The final step of identifying potential problem patrons is "Relate," wherein the employee reports any Yellow or Red customers to other members of the serving team (waitress and security person). The training session made extensive use of role-playing exercises to build skill in each stage of the SIRR system.

Session IV. Responses to Potential Problems (4 hours)

This session focused on what steps should be taken with each of the three color-coded categories of customers (Green, Yellow, or Red) determined by the SIRR procedures. Green customers were given normal good service, with food promotion and deliberate rate of service to keep them Green. The Yellow customers were asked whether they might prefer a nonalcoholic beverage or perhaps some food, with the explanation that their level of consumption, while not unacceptable, might lead to intoxication. Red-coded customers (who would reach their drink-size limit after one more drink) were strongly urged to reconsider the order for an alcoholic beverage. It was explained that they could be served one more drink but then could not be served another alcoholic beverage for another hour. If the customer was coded Red because of obvious signs of intoxication, no more alcohol was served to that person that night; and alternative ways home were found to make sure that he or she did not drive. As with the previous session, roleplaying was used to build skill in intervening for each type of situation.

Session V. Putting It All Together (4 hours)

As suggested in its title, this session combined what was learned in Sessions III (SIRR) and IV (Green, Yellow, Red) to give trainees further practice in identification and intervention. Many varied roleplays were conducted. The session concluded with a review of new policies by the club manager, with emphasis on how those policies are directed toward the same goals that were brought out in the training.

Our experience with the training was that employees were, overall, quite interested in the curriculum, many saying that the program was long overdue. Their participation was probably enhanced by the lack of opportunities for them to meet outside of working hours and discuss mutual problems and experiences.

Evaluation Design

The evaluation of the server intervention program is comprehensive in that it includes an assessment of program development and implementation (so-called process evaluation) as well as a design to measure the impact or outcome of the program, i.e., its effects on both the establishment and its customers.

The study design was guided by several broad principles held by the research team. First, as we are aware of no previous evaluation of server intervention, we consider the present evaluation to be more exploratory than confirmatory in nature. We wanted the research to remain as open as possible to unanticipated developments in the field, and we wanted to employ forms of data collection that would allow us to discover important elements that might otherwise have been overlooked.

Second, we feel quite strongly that evaluation research should strive to link process and impact analysis (see Hollister et al. 1979). Fortunately, many researchers now recognize the limitations of either form of analysis in isolation from the other. We often find, for instance, that summative evaluation results leave so many questions unanswered that they are nearly useless to policy and program audiences, especially if the results cannot show an impact. There is an unlimited number of ways for a program not to work, and if nothing can be said about how and where the program was implemented and where difficulties were encountered, then the next attempted program will have to start from scratch and could easily duplicate the weaknesses of the previous effort. Process and impact evaluation complement each other and, we believe, should be employed together whenever possible.

Evaluation research should strive to link process and impact analysis.

Process Evaluation

Several procedures were employed to inform us about the development and implementation of the program. Face-to-face interviews were conducted with individual employees to determine how they understood their work, the customers, alcohol, alcohol-related problems, and the role of the club in preventing those problems. Unstructured observations and participant observations were made for many hours over a period of weeks in order to become acquainted with preprogram practices and operations. Critical notes were taken during each training session, which ended with a brief feedback questionnaire being given to all participants. Server training was preceded and followed by administration of a questionnaire intended to measure knowledge and attitudes about liquor liability, alcohol, the serving of alcohol, and the legitimacy of server intervention. Finally, on Thursdays, Fridays, and Saturdays for the month following program implementation, waitresses, security personnel, bartenders, and duty managers were interviewed while on the job in an effort to measure how much training and policy had been translated into practice. Notes from observations were also being made during the course of these evenings.

Our primary goals in process evaluation were to understand how well the program fit into its setting, how successfully individual elements were implemented, and which factors may have been most responsible for program successes and failures. Which policies worked in practice? Which elements of the training were the most difficult to communicate? What role do customers play in the program implementation? To what extent does implementation depend on motivation? On skills? These are the kinds of questions we will address as our analysis proceeds.

Outcome Evaluation

Program impact is notoriously difficult to measure, especially when the program's target is an organization rather than individuals. We hoped to compensate for inherent measurement weaknesses by combining a multitrait, multimethod scheme (Campbell and Fiske 1959) with a nonequivalent control group design using pre- and posttesting (Cook and Campbell 1979).

The data used in our evaluation came from three basic sources: (1) archival data collected by the club or other Navy offices, (2) observations of customers' behavior, and (3) face-to-face interviews with randomly selected customers.

Archival materials include data on patronage; total liquor, beer, wine, and other beverage sales; sales by individual waitresses; number of customers reprimanded for specific rule violations (including fights, underaged drinking, and "overintoxication"); and number of times the base police had to be called for assistance. Additional archival data were collected on the number of onbase DUI arrests and on the monthly size of the base population. These data cover a period of 5 months prior to and 4 months after the beginning of the intervention period, which began in early September 1985.

Customer behavior was assessed by observation and interview. These data were collected for a period of 3 months prior to and 3 months after the intervention period began, on every Thursday, Friday, and Saturday evening. A team of two field workers would enter the club at a fixed time and then find an empty table that afforded a good view of other tables. Each observer then selected two or three tables to observe. For a 2-hour period, the team recorded the time at which a customer or group of customers arrived at a table, a description of the group's composition, and the time at which a new drink was brought to the table. Times at which members of the group left or returned to the table were also recorded, along with the time of departure or the end of the observation period, whichever came first. After the observation period was over, the team then conducted a small number of interviews with randomly selected customers. The interviews included items on each customer's arrival time, his or her expected length of stay, food and alcohol consumption while at the club, frequency of patronage, satisfaction with club, self-reported frequency of drunkenness, beliefs about his or her drinking limits, and demographic characteristics.

With these data, we plan to address a number of questions about the impact of the program. We plan to look for a drop in the number of alcohol-related incidents in the club, of course, but we also are keenly interested in the impact of the program on the distribution of alcohol consumption among customers. How many customers are drinking at levels that would require intervention? If the program does have an impact on the customers' consumption, will it be across the board, lowering consumption among light, moderate and heavy drinkers? Or will it affect only the latter? Will its impact be to truncate the distribution at the high end, leaving other drinkers unaffected? Or will there be a modest effect on moderate drinkers and a more powerful one on the more heavily drinking customers?

Table 1 Comparison of Mean Values on Selected Outcome Measures[1] at Intervention and Comparison Site for Pre- and Postintervention Periods

Measure	Site	Preintervention	Postintervention
Number of Drinks Consumed Prior to Interview	Intervention	5.7 5.6 (163)	4.9 4.8 (197)
	Comparison	6.2 6.1 (104)	5.5 5.6 (139)
Number of Drinks "In the System"[2]	Intervention	3.9 5.0 (161)	2.8 4.1 (197)
	Comparison	4.3 5.6 (104)	3.6 4.8 (138)
Rate of Consumption (Drinks per Hour)	Intervention	3.5 4.8 (160)	2.3 2.0 (196)
	Comparison	3.2 3.0 (103)	2.8 2.5 (138)
Percentage of Customers with BACs of .10 Percent or more	Intervention	33 47 (159)	21 41 (196)
	Comparison	30 46 (103)	29 46 (135)

[1] *Mean Standard Deviation (Number of Cases)*

[2] *Equals total number of drinks minus number of hours at the club*

We are also concerned with the program's impact on sales and on the overall financial health of the establishment. Sales and patronage data will enable us to estimate per capita sales and the club's ability to attract and keep customers.

Early Results

The program went into full implementation on September 11, 1985. At the time of this writing (January 1986), we have just begun to look at the data collected from customer interviews. From interviews with club staff and from our own observations, we have some additional preliminary indications of how the program is working.

Customer reaction has been mild and positive. Sale of beer by the pitcher was eliminated, but plastic cups were replaced by glassware at the same time, so that customers perceived the change as an "upgrade" and were happy with it.

There were early indications that some waitresses were having difficulty with drink counting. Though all waitresses were able to keep track of their customers' absolute number of drinks, some were forgetting to account for the length of time that the customer was there, resulting in premature intervention in some cases. Individual on-the-job training helped overcome this problem.

The new policies and training emphasized the need for regular communication between waitresses and security staff, especially for identifying customers who needed watching. These two groups of staff had nothing to do with each other prior to the program, and old habits were hard to break. We often found that waitresses did not know where the closest security person was and would not contact him or her about specific customers. Likewise, a security person may have seen a customer with signs of intoxication but would not report the fact to the waitress. Newly hired security staff, however, were highly conscientious about keeping in touch with the waitresses.

Solicited and unsolicited reports from club employees indicate that the staff feels that the program is having an observable impact. As one duty manager puts it, "In the month since the program went into effect, I haven't seen one sleeper—and a lot less stumbling drunks." As we continue to review the data, we will find out whether the staff's impressions are borne out.

A look at some selected outcome measures from the interview data gives us reason for optimism. Table 1 compares four measures of alcohol consumption before and after the program went into effect at the intervention site. The table shows, for the first three measures, a decline in consumption for both sites, but a larger drop at the intervention site. The percentage of customers with presumed BACs of .10 percent or more was unchanged at the comparison site but was cut by one-third at the intervention site, a sizeable change for this phenomenon (presumed BAC was calculated using the customer's consumption, weight, and length of stay at the club prior to the interview). The four measures are ordered, in a sense, by how large an impact the program was expected to have. The program was not specifically targeted to light and moderate drinkers, so we did not necessarily expect the per capita consumption to decline to the same degree as percentage of intoxicated customers. (In fact, there was no discernable program impact on per capita consumption.) Further analysis will reveal how the different kinds of drinker were in fact affected by the intervention.

As a check that the results were not biased by differences between pre- and postintervention samples, similar means were calculated for customer age, sex, rate of patronization, and length of time at the club before being interviewed (see Table 2). There seem to be no major differences in sample composition over the two time periods. If the rate of patronization can be treated as an outcome measure, the program does not seem to have driven customers away from the test club.

As of this writing, results are not available concerning the program's impact on business. In discussions with managers, we have learned that gross sales varied similarly at the two sites, with a sales spurt in the first and third months following implementation of the program, and drops in sales for the second and fourth months. Sales records data are currently being analyzed.

These early indications give us hope that server intervention is, indeed, a viable strategy for reducing the risks associated with drinking to intoxication. If further analysis corroborates the findings presented here, prevention specialists should press for policies that promote the widespread development of server intervention programs. These would include a reform of current dram shop laws to maximize their potential for prevention, the development of a standard server training curriculum and the means to deliver it, and a solution to the current lack of affordable liability insurance for those many owners and managers of retail alcohol beverage outlets who have a genuine commitment to protecting their customers and serving the community. ■

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(references continued on page 35)

Table 2 Comparison of Mean Values on Selected Descriptive Measures[1] at Intervention and Comparison Sites for Pre- and Postintervention Periods

Measure	Site	Preintervention	Postintervention
Age	Intervention	21.1 2.5 (162)	21.8 3.6 (197)
	Comparison	21.9 3.9 (104)	20.9 2.1 (137)
Percent Male	Intervention	80 40 (162)	76 43 (196)
	Comparison	84 37 (104)	81 40 (139)
Number of Times Patronized Club in Last Month	Intervention	3.8 4.9 (157)	4.0 5.2 (192)
	Comparison	5.9 7.0 (103)	5.6 6.3 (138)
Number of Hours at the Club Prior to Interview	Intervention	2.1 1.3 (161)	2.4 1.3 (197)
	Comparison	2.1 1.2 (104)	2.2 1.3 (138)

1. Mean Standard Deviation (Number of Cases).

NHTSA Responsible Beverage Service Research and Evaluation Project

MARIA E. VEGEGA, PH.D.

The National Highway Traffic Safety Administration (NHTSA) is developing and testing two programs for training individuals in the responsible service of alcohol. One program is directed toward commercial servers of alcohol, while the other is designed for social hosts. Evaluation is a crucial element of the project, and both programs will be fieldtested to assess their effectiveness in preventing incidents of alcohol-impaired driving.

The objectives are similar for both programs. They include:

- raising awareness concerning the drinking-driving problem and what action servers of alcohol and social hosts can take to prevent it;
- increasing the willingness to take action to prevent alcohol-impaired driving among patrons and friends;
- increasing the ability to prevent drunk driving; and
- determining the effectiveness of each program in deterring drunk-driving incidents.

Because of the demand for alcohol server education programs, initial emphasis was placed on the development of the program for commercial hosts. Consequently, of the two programs, this one is the more fully developed. Field-testing was begun in the spring of 1986. This discussion will focus primarily on the training program for commercial servers of alcohol.

The alcohol-service program is delivered in 6 hours of instruction via six modules. An optional seventh module on training has been included for those participants who will be expected to teach the program to others (e.g., their employees).

The emphasis is on prevention—that is, if alcohol service is performed responsibly, it should not be necessary to terminate service to customers.

The thrust of the program is to provide servers with a set of strategies they can employ to prevent patrons from becoming intoxicated. The emphasis is on prevention—that is, if alcohol service is performed responsibly, it should not be necessary to terminate service to customers.

The 6-hour program is divided into two segments. All participants receive the first 3 hours of training (Modules 1–4). The last 3 hours (Modules 5 and 6) consist primarily of roleplaying exercises for managers and other individuals responsible for terminating service to patrons. The modular format of the program allows it to be delivered in shorter segments over a period of time, although a 1- or 2-day format is recommended.

Instructional materials consist of videotapes and a detailed instructor's guide providing information on conducting the sessions; performance, knowledge, and attitude objectives; lesson plans; background material on the drinking-driving problem; before-and-after knowledge and attitude tests; and roleplay scenarios.

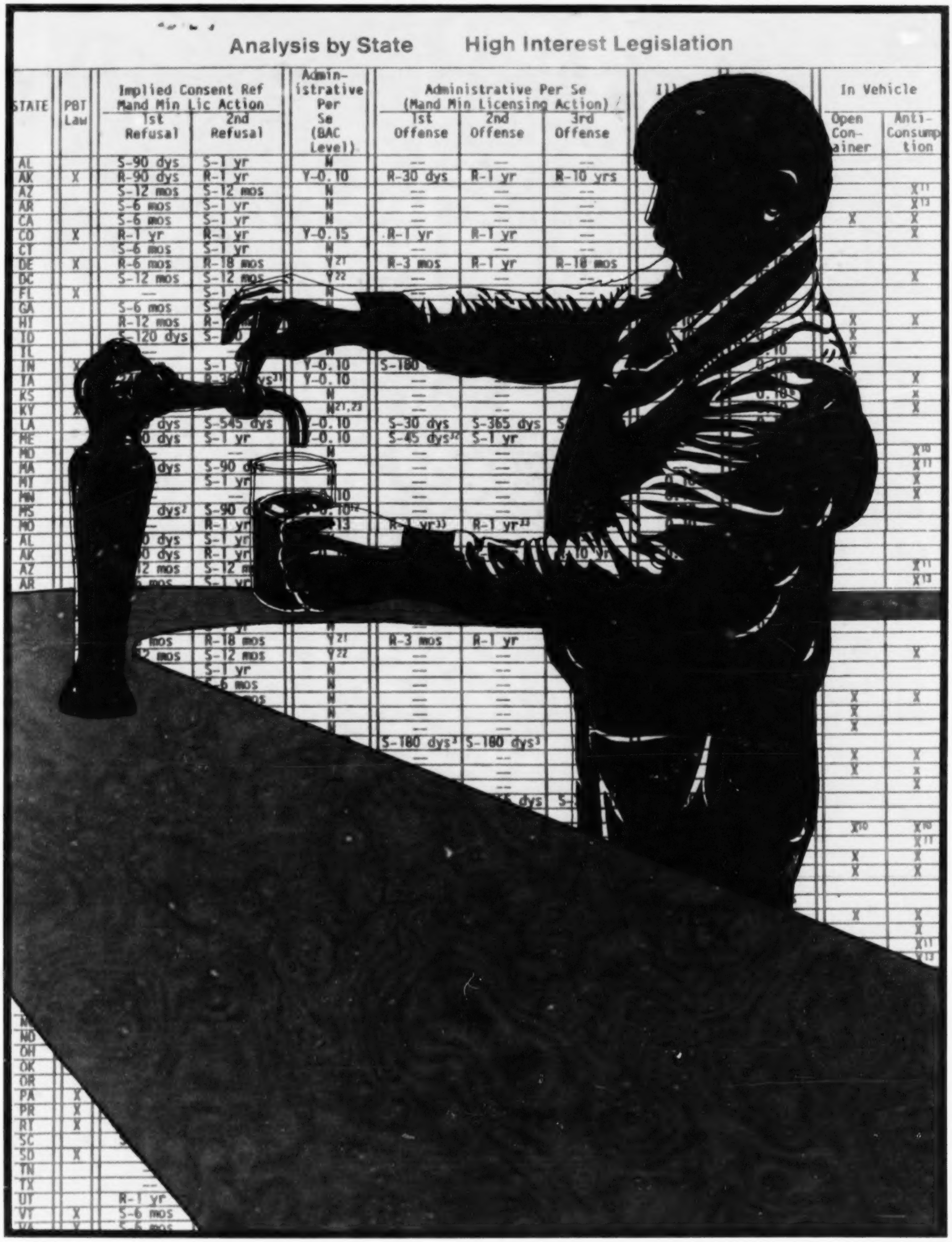
The first four modules employ videotapes and discussion. Three of these videotapes depict action in a service establishment. Each videotape is approximately 15 minutes long and each presentation is followed by a discussion of the material on the videotape.

Module One, titled "Awareness," provides an overview of the program and introduces the concept of server liability and its implications in the daily operation of a commercial establishment.

Module Two, "Need for Responsible Alcohol Service," focuses on the immediate need for server intervention by emphasizing the moral and legal responsibility to prevent intoxicated patrons from driving. The physiological effects of alcohol are also addressed.

Module Three, "Prevention," describes strategies to control consumption and reduce the levels of impairment. Such techniques include checking IDs for signs of tampering, serving food and nonalcoholic beverages, providing activities (e.g., entertainment), and observing patrons for signs of impairment. The stricter standard of preventing impairment, not just intoxication, is emphasized.

Module Four, "Intervention," discusses what can be done when customers become intoxicated. A series of scenarios is presented in which patrons' drinking is slowed down, service is terminated, alternative transportation is found, and a fight is broken up. Servers inform managers of the potential problem; however, it is the managers who take action.


Analysis by State
High Interest Legislation
STATE
PBT Law
Implied Consent Ref Mand Min Lic Action
1st Refusal
2nd Refusal
Administrative Per Se (BAC Level)
Administrative Per Se (Mand Min Licensing Action)
1st Offense
2nd Offense
3rd Offense
In Vehicle
Open Container
Anti-Consumption

Following the above presentations and discussions, managers participate in roleplay exercises (Module Five) that allow participants to test their intervention skills, refine their strategies, and increase their skill and confidence in using intervention techniques.

Module Six, "Responsible Alcohol Service Policy," discusses responsible alcohol service business practices. It encourages managers to generate ideas and work out policies that can be employed in their own establishments.

Several crucial considerations became evident in the development and early pilottesting of this program: It was important that the program be feasible to administer; short enough to ensure participation by bar and restaurant employees; and comprehensive enough to provide the information and skill practice necessary to increase the motivation, willingness, and abilities of servers to deter drunk-driving incidents. In addition, the program had to be developed so as to enable local community and business groups to take over easily and administer it at the end of the NHTSA project.

The program [was] to be developed so as to enable local community and business groups to take over easily and administer it.

It was concluded that the use of videotapes would facilitate program dissemination, ease the instructional burden, and provide greater quality control over the material being presented. To provide servers with both the skills and confidence necessary to intervene, the program also had to include roleplaying exercises.

It was also necessary to protect the livelihood (i.e., tips) of servers. Consequently, the program emphasizes that persons in positions of authority, such as managers or other designated individuals (e.g., head bartender, head waiter, security officer), should be responsible for terminating service to the customer.

An important component of this program is its evaluation. Although there has been a proliferation of server education programs over the last few years, little effort has been devoted to evaluating the effects of such programs, either in terms of modification of serving practices or in terms of measuring the reduction in alcohol-impaired driving. Accordingly, the effects of the program—on server knowledge and attitudes, on serving practices, on whether servers actually utilize the skills fostered in the training program, and on alcohol-impaired driving—will be evaluated. Areas to be addressed include increased knowledge (physiology of alcohol, drunk-driving problems, determinants of blood alcohol concentration, third-party liability); positive attitude formation (responsibility for preventing alcohol-related problems, motivation to engage in prevention activities); skill and confidence in recognizing signs of impairment and taking action to avoid overservice; reduction of drinking-driving incidents; and the extent of program distribution and use.

Finally, as indicated earlier, a program to train social hosts in responsible alcohol service is also being developed. The program will be approximately 2 hours in length and will include a 20-minute videotape presentation, discussion of strategies, and 1 hour of roleplaying. The current intent is to encourage social clubs (e.g., fraternal groups, civic groups, theater clubs, sports clubs) to adopt policies of responsible alcohol service at their social functions. The program will emphasize that strategies adopted by the club can also be employed at private parties in members' homes. It is clear that evaluation of such a program poses a challenge. However, a responsible alcohol service program for social hosts would be a valuable addition to the available repertoire of community prevention activities.

A final report on the evaluation results of both programs is expected in late 1987. ■

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Server Training Programs: Profiles

Researchers are just beginning to explore the elements of content and format that make for the most effective and useful server training programs (see page 12, "Server Intervention: Will It Work?" and page 20, "NHTSA Responsible Beverage Service Research and Evaluation Project"). However, interest in such programs has been growing for several years, created by hospitality industry demand and—beginning in Madison, WI in 1981—by legislation mandating server training for alcohol licensees in some locales including the State of Oregon. During this time, dozens of programs have been developed by a variety of public, private, and for-profit organizations. A sampling of a few of the programs currently in use is described below. This is by no means a complete list, and no recommendation or endorsement of any program is intended or implied.

- ***HEART: Help End Alcohol-Related Tragedies (2 hours for servers, 10 hours for managers; South Carolina Commission on Alcohol and Drug Abuse, 3700 Forest Drive, Columbia, SC 29204)***

  Server curriculum uses lecture and discussion supplemented by a handbook and a 45-minute videotape. Content includes discussions of variables affecting individual responses to alcohol, characteristic signs of impairment, promotion and sales practices, and intervention tips. Some material (e.g., dram shop legislation, drunk-driving laws) is specific to the State of South Carolina. Managers' program covers the same topics in greater depth and emphasizes dram shop liability, policy development, and management practices.

- ***HOST: Hints on Serving Travelers (Remove Intoxicated Drivers/New Jersey, P.O. Box 1614, Wayne, NJ 07470)***

  Not really a curriculum *per se*, but an educational and promotional campaign designed to encourage social hosts to adopt responsible serving practices. Materials package includes a brochure that summarizes the 1984 New Jersey Supreme Court

ruling on social host liability and offers tips on hosting safe parties. The package also includes key rings, bumper stickers, buttons, and other novelty items imprinted with the slogan "Hosts don't let guests drive drunk" as well as recipes for nonalcoholic drinks.

- *Management/Server Alcohol Awareness Program (3.5 hours; National Restaurant Association, Educational Programs Department, 311 First Street NW., Washington, DC 20001)*

  Designed primarily to prepare managers to train their service personnel. Employs manuals, audiovisual materials, self-testing, and roleplaying. Topics covered include driving while intoxicated, restaurateurs' legal responsibility in serving alcoholic beverages, assessment of intoxication in customers, how to handle customers at different levels of intoxication, techniques of intervention, the dynamics of drinking behavior, alternative modes of transportation, and establishment of a suitable atmosphere for the consumption of alcoholic beverages.

- *Professional Beverage Server: Alcohol Server Awareness Curriculum (12 hours; Wisconsin Office for Highway Safety, P.O. Box 7910, Madison, WI 53707)*

  For servers and managers; primarily lecture-discussion format. Manual includes instructional plans, readings, and test questions. Topics covered include the history of alcoholic beverages and how they are produced, attitudes about their use, alcohol myths and facts, alcohol effects, and intervention techniques. Some material is specific to the State of Wisconsin (e.g., drinking-and-driving laws, licensing regulations). Optional segments discuss fire safety, health and sanitation, medical emergencies, and drugs other than alcohol.

- *TAM: Techniques of Alcohol Management (6–8 hours; National Licensed Beverage Association, 309 North Washington Street, Alexandria, VA 22314)*

  For servers, managers, and most other employees of onpremise establishments (modified programs also available for employees of convenience and grocery stores). Employs manual, lecture-discussion materials, and videotapes on the effects of alcohol and factors influencing absorption, alcohol-drug interactions, techniques for managing customers' alcohol consumption, assessment of ID validity, and how to handle bar fights. Program is offered primarily through State affiliates of the National Licensed Beverage Association.

HEREIU

- *TIPS: Training for Intervention Procedures by Servers of Alcohol (length variable, see below; Health Communications Inc., 600 New Hampshire Avenue NW., Suite 475, Washington, DC 20037)*

  Available in three versions: (1) on premises (6 hours), for bartenders, waiters, and waitresses; (2) concessions (2.5 hours), for employees in stadiums, concert arenas, and fairs; and (3) off premises (2.5 hours), for cashiers and other employees of grocery, convenience, and package stores. Employs manuals, audiovisual presentations, and roleplaying; emphasis is on general alcohol information, identification of troublesome drinkers, and development of intervention skills. A program for trainers (12 hours over 2 days) is also available. Both servers and trainers can be certified upon passage of a written examination. ■

Beyond Server Training

An Examination of Future Issues

JAMES E. PETERS

Like hordes of locusts, alcohol awareness programs are sweeping the hospitality industry. Offered in a variety of formats, all promise to be *the* program to solve the restaurant or bar operator's liability problem. However, the solution to liquor liability problems extends beyond just developing a beverage server's technical skills, such as determining when a customer is intoxicated and knowing how to refuse service; it is also necessary to create the environment in which the training can be useful and effective.

The primary purpose of bars, taverns, restaurants, and social clubs is hospitality, not just selling beverage alcohol. Hospitality is service, and service is meeting the customer's needs, providing a range of choices, making the customer feel comfortable, protecting the customer's health and safety, and respecting the rights of *all* customers, including drinkers and nondrinkers, smokers and nonsmokers, men and women, young and old. The reason for being in the hospitality business is the customer.

Most people involved in the anti-drunk-driving movement realize the impact changing attitudes about the use of beverage alcohol have had on the bar and restaurant industry. Yet few are aware that other public health issues also require industry responses, including regulations on smoking, a national food sanitation certification program, and truth-in-menu laws.

At the same time, dual-career couples, a strong economy, and the diversity of eating and drinking establishments have contributed to an increase in dining out in America. This trend is expected to continue, enlarging the demand for employees in the hospitality industry. The U.S. Department of Labor foresees the need for 3.5 million additional employees in the food service industry over the next decade. Yet it is during this period that the traditional labor pool will shrink dramatically as the number of people in the 16-to-24-year-old age group declines and as additional career opportunities open up for women.

It follows that the roles and responsibilities of servers will become—indeed are becoming—more complex. In some ways, bartenders, waiters, and waitresses could become agents for public health and safety at least as much as for private enterprise. This philosophy is not new—the use of bartenders as mental health referral agents was explored as long ago as 1966 (Hunt 1972)—but public policies have yet to be developed that reflect this trend and thus create the resources necessary for the hospitality industry to fulfill its social responsibilities while still maintaining profitability.

It was a recovering alcoholic bartender who authored the first published reference to the bartender as an agent to prevent alcohol abuse (Cowan 1978). This role was expanded to include the prevention of drunk driving in a California project (Mosher and Wallack 1979) that served as the foundation for most server training programs available in the United States today. This project combined the resources of the State regulatory agency and alcohol education agency, law enforcement, and retail beverage establishments.

It may seem obvious to include businesses that serve beverage alcohol and agencies that regulate these businesses in the process of developing public policies for the prevention of alcohol abuse and drunk driving. Until recently, however, little progress was made in carrying out the supposedly obvious.

Harrison and Lane (1936), in a review of public policy after the repeal of Prohibition, noted that nowhere was the function of liquor control assigned to State departments of public welfare. The desire to generate revenue for the States was stronger than the conscious desire to promote public health and safety. Many of the States were unable to fund the development of the regulatory agencies, and they depended upon the producers of alcoholic beverages to finance much of the administration and, in the case of control States, the inventory for the retail stores.

It is ironic that today, more than 50 years after the repeal of Prohibition, regulatory agencies still function as tax-collection and licensing bureaus with limited funding for enforcement or educational efforts to promote "temperance" and that the most widely available server training programs are financed and implemented by the producers of alcoholic beverages.

The Future of Server Training

The concept of server training is well established. Madison, WI, was the first municipality to mandate training (in 1981), and other towns and cities in the State have followed suit. Last year,

Alexander Tucker

Patrons at this fitness club's juice bar enjoy nonalcoholic beverages in a healthful environment.

Oregon became the first State to pass legislation mandating training statewide for all servers and managers. Similar legislation has been introduced in other States.

Elsewhere, other forms of legislation or policy provide incentives for alcohol awareness training. In Massachusetts, the Joint Underwriting Association (JUA) was formed to provide insurance for liquor liability. The JUA provides a 10 percent premium reduction for establishments training at least 75 percent of their staff. Several State legislatures have introduced bills allowing "responsible business practices" as a defense in dram shop lawsuits; server training is considered a responsible business practice.

If training becomes mandatory, either directly or indirectly, then many questions emerge. Who should provide the training? How much training is enough? How will participation in a training program be documented? Who will enforce compliance? What will the penalties be for noncompliance? How will the program be evaluated? Who will pay for it all?

In recent years other concerns have emerged as well, based on experience with early efforts in server training. Is the true problem the lack of alcohol awareness among service personnel in bars and restaurants or is it an inability to refuse service to people who are intoxicated? Awareness can be raised through education. Human relations skills are not so easily acquired. They may be ineffective in an establishment whose business practices foster and accept abusive drinking behavior.

How, then, can the training of service personnel be carried out so as to encourage them to fulfill their legal and social responsibilities for protecting the public's health and safety? And how can the business practices of successful establishments be regulated so that they do not subvert the goals of the training?

Planning and Development

The hospitality industry is the most socially significant for-profit service industry in the country, providing products and services intimate to all of our lives. Selling food, beverages, lodging, and meeting space thrusts exceptional responsibilities on those businesses engaged in the activity. Irresponsible business practices can result in serious health and safety problems for the community, especially in relation to alcoholic beverages. Safeguarding the public from such lapses has traditionally and logically been the task of administrative agencies, because of the "great flexibility of the regulatory process" (Bellhorn and Boyer 1981).

The administrative agency that is in the most obvious position to regulate the practices of those businesses serving alcoholic beverages is, I believe, the alcoholic beverage control (ABC) commission. In part because of its ability and authority to influence the opening and the day-to-day operations of businesses serving alcohol, it is only logical to allocate to this agency some responsibility for overseeing certain other areas of public health and safety as well.

The necessary infrastructure already exists. Each of the 50 States has an ABC agency in place that oversees the practices of wholesale and retail alcohol businesses. Eighteen States (and Montgomery County, MD) have chosen the control or monopoly system, in which the ABC commission functions as both the sole retailer (of distilled spirits) and the regulatory body. The remaining 32 States have adopted the open or licensing system, in which the ABC agency issues licenses to businesses for onpremise or offpremise sale of alcoholic beverages. In most cases, within general limits set by the State agency, local governing bodies are given a certain flexibility in regulating the number of alcoholic beverage businesses in their communities as well as their management practices.

In recent years, ABC agencies have also shown that they can respond directly to alcohol-related public concerns within their purview. Massachusetts provides a good example of an agency working with a variety of groups within the State to promote the public health and safety.

In 1984, when concern arose in Massachusetts about "happy hours" and several local licensing authorities imposed happy-hour bans in their communities, the chairman of the State ABC commission initiated a series of public hearings. The Massachusetts Restaurant Association worked cooperatively with the commission to formulate acceptable and practical standards for retail marketing practices. Once these were defined, the association distributed copies of the regulations to all its members. The ABC commission then began to enforce the regulations in a joint effort undertaken with the Department of Public Safety.

These pioneering efforts by the Massachusetts ABC commission illustrate that such agencies can adapt their administrative expertise to coordinate activities among industry, public health and safety, and community groups—even with limited resources (the State has fewer than 20 investigators to monitor about 17,000 licensed establishments). Other States face similar personnel problems; their ABC agencies are usually underfunded and understaffed in proportion to their responsibilities and the funds they generate.

In order to promote their continued development in this role, therefore, it may be necessary to restructure their administration and to redefine their purpose as public health agencies. Serving as a coordinating link between the diverse public health and safety agencies and the many businesses comprising the hospitality industry is an important role that has been neglected thus far, yet it should be seen as the most important goal of a progressive public policy on health and safety issues. Much can be accomplished in this role to protect the public welfare while supporting an important economic institution.

Devising prescriptions for responsible business practices and appropriate server training will be a primary responsibility of the agency. In the area of alcohol control, regulations could be updated and revised to reflect more accurately the changes in attitudes, knowledge, and culture since 1933, when most of these regulations were developed. An advisory commission—including representatives from the hospitality industry, highway safety group, alcohol education, other public health agencies, the insurance industry, law enforcement, the criminal justice system, and general educational institutions—could work with the regulatory agency to determine what is needed and to develop education and responsible hospitality training curricula for employees and managers.

Server and manager training developed through this process could meet the needs of many constituencies. Agencies representing highway safety might want to emphasize drunk driving and seat belt usage; agencies representing alcohol abuse and alcoholism prevention might want to promote factual information on alcohol, alternatives to abuse, and identification of treatment agencies; other public health and safety agencies would want to see the training include information about sanitation, smoking, emergency medical intervention (e.g., the choking customer, drug-alcohol interactions), and other general health and safety issues. The hospitality industry would need to identify legal and regulatory responsibilities, develop the human relations skills to carry out these social and legal responsibilities, and develop the professionalism employees need in order to be productive and to boost profitability.

Independent attempts by these groups to develop and implement training would lead to biased programs that would waste resources and would confuse those who are aided. In fact, this is the current state of affairs, as demonstrated by the wide variety of programs available on alcohol awareness training, ranging from 20-minute videos to 18-hour programs extending over a period of 6 weeks.

Implementation: Reinvesting the Wheel?

Once the curriculum and program details are worked out, the question of implementation arises. Currently, alcohol awareness training is being provided by producers of alcoholic beverages, trade associations, private firms, and public health and safety agencies. There is very little uniformity in content or in the qualifications of instructors. Program design thus far has been more responsive to considerations of time and money than of effectivness in leading to behavioral change.

As participation in a training program becomes more crucial to obtaining liability insurance and licenses to serve alcoholic beverages or as a defense in a lawsuit, documenting the degree of participation will become more important. Many programs issue certificates for little more than the payment of a fee, and some do not maintain adequate records. Others are offered sporadically and often without followup or the provision of community-based support services.

How can these problems be avoided? Should special schools be established? Who will pay for the training?

The criteria for a sound delivery system should include the administrative capabilities to monitor registration, participation, instructor qualifications, curricula, quality control, and maintenance of records. The system should have credibility with regulatory agencies and the legal system. The courses should be available periodically, offered at convenient sites, and supported by followup services or training. Costs

must be kept reasonable for the market, i.e., small businesses whose employees usually work at or slightly above minimum wage.

To design such a system from the ground up would be quite costly. However, most States already have networks of vocational schools and community colleges that fulfill all the criteria for effective administration and that offer hospitality management programs with faculty competent to teach alcohol awareness. This network is rapidly expanding: four times as many colleges and universities offer hospitality management programs compared with 5 years ago. All that is lacking are clear and comprehensive curricula that emphasize human relations skill development and the inculcation of a social responsibility ethic.

Administration of Quality Control

When the concept of server intervention is understood and accepted as a logical approach to preventing alcohol abuse and drunk driving, one immediate reaction is to mandate training. The mandate often prescribes punishment for noncompliance, with the all-too-common result that ways are devised to avoid the punishment rather than to comply with the program as it was originally defined. I submit that a more practical means would be to create positive incentives for participation.

There are several possible mechanisms for creating such incentives. One is financial. Participation could lead to reduced insurance premiums, licensing fees, or taxes. The extent of the reduction could be made to depend on the comprehensiveness of participation. For instance, an establishment qualifying for the greatest reductions would have established comprehensive responsible business practices such as a high food-to-beverage sales ratio, promotion of alternative beverages and alternative transportation, a structured selection and screening process for hiring qualified personnel, the training of all management and staff, programs to support community activities to prevent alcohol abuse and drunk driving, and detailed written policies and procedures on responsible beverage service.

Lesser reductions would be awarded to those establishments with less comprehensive practices or that only trained full-time personnel, and still smaller reductions would be awarded to those businesses that trained management personnel only. The highest premiums, fees, and taxes would be paid by those establishments with no policies and procedures and no training of personnel.

Participation and good-faith compliance with the recommended standards could also lead to reduced liability in a civil action. The "Responsible Business Practices Defense" of Section 10 of the Model Alcoholic Beverage Retail Licensee Liability Act of 1985 (Prevention Research Group 1985) provides a basis for this legislative approach.

Finally, benefits to the business of being responsible and caring members of the community, responding to the concerns of customers, and of treating employees with respect and as professionals could be publicized through the media. Such model businesses could be recognized formally by regulatory agencies and by community groups.

Conclusion

People often enter occupations in the hospitality industry because they care about people, want to work with the public, and want to see their customers enjoy themselves. People enter occupations in social service for many of the same reasons. What has been lacking in public policy is a mechanism to link these groups, who often have basically the same values and common goals of serving the public good.

The hospitality industry can maintain profitable businesses without jeopardizing the health and safety of the community. As idealistic as it may seem to propose redefining the role of the regulatory agency and establishing a cooperative commission involving traditionally diverse and adversarial groups, progress along these lines has already been made in several States.

In Oregon, where the legislature imposed mandatory training for servers and managers, an advisory commission like that described above has been meeting with the State liquor control board to develop curricula and criteria for fulfilling the mandate. In Maine, a similar commission has formed voluntarily and has been working with the vocational education system to implement server and manager training throughout the State. It is expected that tort reform will result as well, allowing responsible business practices as a defense against liability.

What may be surprising to some is that the hospitality industry initiated the process in both States. The Oregon Restaurant and Beverage Association sponsored Oregon's legislation, and the Maine Restaurant Association has functioned as the focal point for program development in Maine.

That the groups with an interest in server responsibility issues are diverse and sometimes divided should come as no surprise. But there is no doubt that all agree on the pressing need to reduce the consequences of drunk and drugged driving. An appropriate theme for the future is thus expressed in a remark by the German philosopher-poet Goethe: "The question to ask is not whether we are perfectly agreed, but whether we are proceeding from a common basis of sentiment." ■

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(turn to page 35 for references)

Kurt Mulholland

"Because We Care"

The 1985 National Drunk and Drugged Driving Awareness Campaign

THOMAS PRUGH

National Drunk and Drugged Driving Awareness Week, designated by Presidential proclamation as December 15–21, 1985, was the kickoff of a nationwide consciousness-raising effort designed to focus attention on the dangers of driving while under the influence of alcohol or other drugs. A special effort was made with this campaign to stimulate peoples' willingness to help prevent incidents of drunk or drugged driving; hence the slogan "Because We Care" and the thematic emphasis on server intervention.

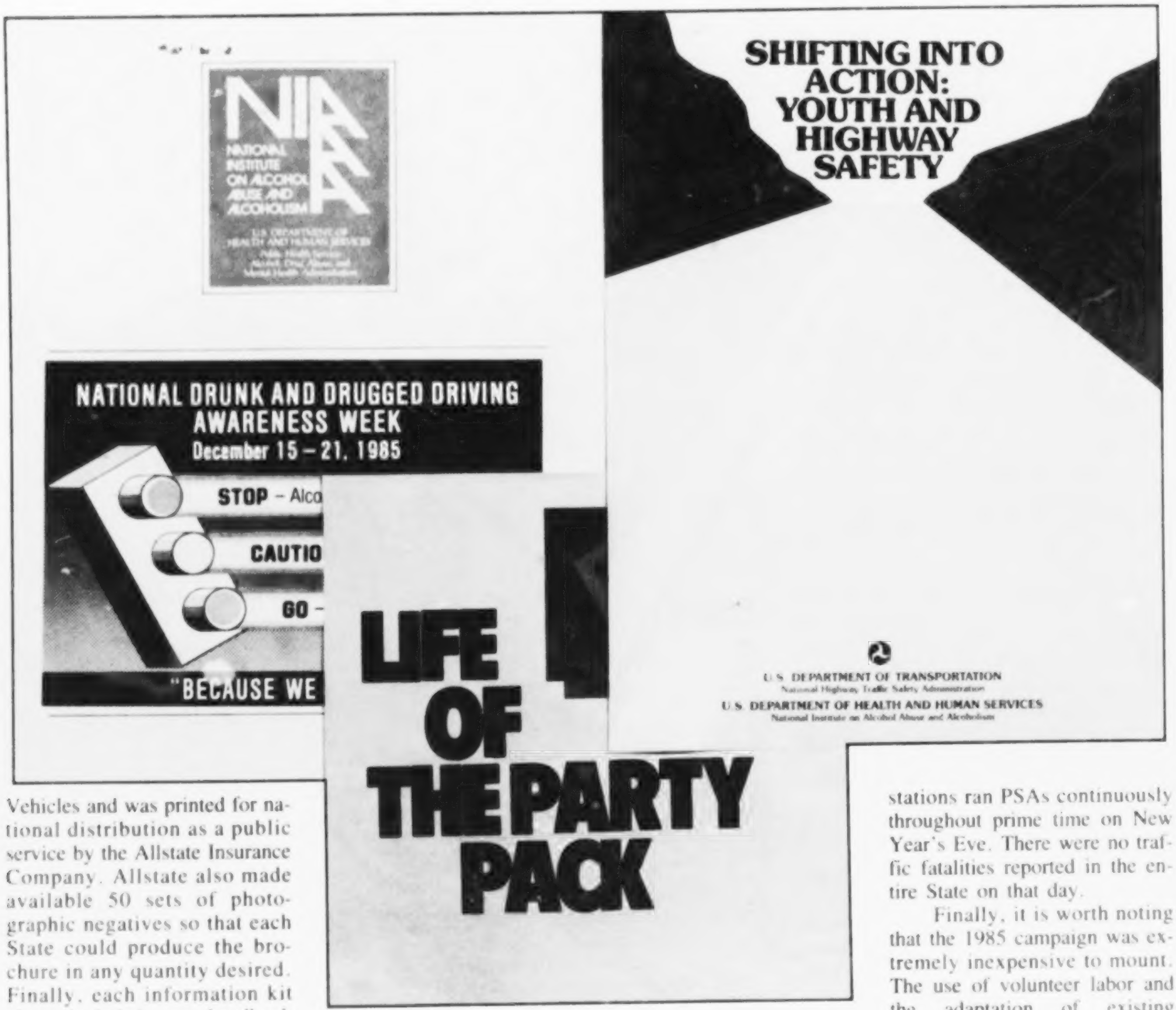
The 1985 campaign—the fourth in a series begun in 1982—was notable for the extent of cooperation among many national, State, and local groups. According to Sandy Katz, public affairs specialist with the Prevention and Public Education Branch of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), "Collaboration with other groups was a big part of the campaign, and was very successful." Planning began in April 1985 with a meeting of representatives from NIAAA, the National Highway Traffic Safety Administration (NHTSA), the National Association of State Alcohol and Drug Abuse Directors (NASADAD), the National Association of Governors' Highway Safety Representatives (NAGHSR), the National Association of Broadcasters (NAB), the Virginia Department of Motor Vehicles, and other concerned groups. This meeting initiated the process of identifying resources, networks, and materials. As in past years, the campaign at the national level was coordinated by NIAAA and NHTSA.

Information materials were distributed to State and local groups in two formats: print items and television public service announcements (PSAs). The PSAs were solicited from all over the country by contacting sources known to have produced such announcements in the past and by askng State-level personnel to identify local sources. From the pool of PSAs thus assembled, eight 30-second spots were selected for distribution. The spots were picked to represent the server intervention theme in a variety of ethnic and regional scenarios; one spot was done in Spanish. Besides NIAAA and NHTSA, sources included the California Highway Patrol and the Oklahoma Department of Highway Safety. The PSAs were delivered to hundreds of television stations nationwide via the National Association of Broadcasters, which volunteered to include them in one of its monthly satellite "feeds." Stations intending to participate in local campaigns simply recorded the telecast for later use. The Armed Forces Radio and Television Service also distributed the spots to its affiliates around the world.

Preliminary data suggest that the PSAs received extensive airplay and were seen in millions of homes. Reports for December 1985 and January 1986 indicate that nearly 2,500 spots were aired during the 2 months. In December the PSAs reached 53 percent of TV homes and 56 percent of major TV markets. In January, 48 percent of TV homes and 47 percent of major markets were reached. During both months, a substantial proportion of all the PSAs were aired between the hours of 5:00 a.m. and 11:30 p.m. To have purchased the free airtime would have cost over $450,000; the spots themselves were actually reproduced and distributed for about $1,500.

Print materials also were solicited from many sources. For the most part, existing materials—some of them updated versions of items used in the previous campaign—were sought out and then adapted or repackaged for use in 1985. Reliance on the extensive network of State and local prevention workers made this collection process possible and, Katz believes, improved the quality of the campaign. "Although the campaign was coordinated at the national level, the emphasis was on State and local efforts, and use of local materials promoted a sense of ownership and commitment," she says.

More than 2,000 information kits—designed for easy and wide reproduction—were assembled and distributed to members of the National Prevention Network, NAGHSR members, NTGSA regional personnel, the planning committee members, workers active in previous campaigns, selected media representatives, and others. Each kit contained fact sheets on fatalities caused by alcohol-impaired driving, tips for hosts and guests on avoiding alcohol-related problems at social events, lists of resource organizations, and information on how to tag PSAs for local use. Two centerpiece items were an activities book describing prevention projects and a colorful brochure entitled "Life of the Party Pack," which discusses how to keep a party safe and describes a variety of enticing party foods and nonalcoholic drinks. The brochure was adapted from one developed by the Virginia Department of Motor


NIAAA
NATIONAL INSTITUTE ON ALCOHOL ABUSE AND ALCOHOLISM
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
SHIFTING INTO ACTION: YOUTH AND HIGHWAY SAFETY
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institute on Alcohol Abuse and Alcoholism
NATIONAL DRUNK AND DRUGGED DRIVING AWARENESS WEEK
December 15 – 21, 1985
STOP – Alco
CAUTIO
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"BECAUSE WE
LIFE OF THE PARTY PACK

Vehicles and was printed for national distribution as a public service by the Allstate Insurance Company. Allstate also made available 50 sets of photographic negatives so that each State could produce the brochure in any quantity desired. Finally, each information kit also included a handbook on how to develop community-level programs for 16-to-24-year-olds.

As in past campaigns, State officials capitalized on the promotion of National Drunk and Drugged Driving Awareness Week and generated local and regional programs and events. In South Carolina, for example, the commission on alcohol and drug abuse brought local- and county-level prevention coordinators together with educators, advertising professionals, and media experts. This event was a prelude to TV and radio talk show appearances by prevention staffers and State representatives of MADD (Mothers Against Drunk Driving). The server intervention theme also tied in with ongoing work by the commission in promoting its own server training programs for commercial hosts and with efforts to encourage South Carolina's hospitality industry associations to develop beverage service policies for their members.

Georgia, like many other States, adapted the information kits by adding to them some local data on alcohol-related problems and fatalities. Campaign workers got some of the campaign artwork incorporated into greeting cards and promotional inserts for paycheck envelopes. The campaign's message was further driven home through cable television shows and film festivals at colleges and universities. State personnel also are working with hotel and restaurant associations to videotape a training package for presentation by a Public Broadcasting Service affiliate.

In one of the most striking payoffs of the 1985 Drunk and Drugged Driving Awareness Week, campaign legwork in Iowa by State program workers and 250 parents' groups produced such enthusiastic support that several television stations ran PSAs continuously throughout prime time on New Year's Eve. There were no traffic fatalities reported in the entire State on that day.

Finally, it is worth noting that the 1985 campaign was extremely inexpensive to mount. The use of volunteer labor and the adaptation of existing materials kept costs to a minimum. This proves, says Katz, that "the Federal Government, with assistance from the States, the private sector, and interested groups, can produce cost-effective and creative campaigns. The cooperation of the public and private sectors ensures that the messages will be widely used and will reach the intended audiences. Key community groups can use the campaign materials as a starting point to address their own needs." ■

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Arena Managers Project

A TEAM Approach

THOMAS PRUGH

Late last year the management and employees of sports arenas in seven cities nationwide began taking part in a pilot program—Techniques for Effective Alcohol Management (TEAM)—designed to provide alcohol education as well as to stave off problems that can arise from alcohol-related problem behavior during sporting events.

However, "TEAM is not just server training," says Michael Impellizzeri, chairman of the National Highway Traffic Safety Administration (NHTSA) Task Force for TEAM. What sets TEAM apart from other programs is its scope. The program was developed with large sports stadiums and arenas in mind and thus is designed to address the potential for alcohol-related problem behavior in tens of thousands of people at a time, not simply the few dozen in a typical tavern or restaurant crowd. Consequently, most of the staff of an arena are involved in the training, from ticket takers on up to top management. The ultimate purposes of the training are to promote effective crowd control and to address the issue of the safety of patrons en route to and from, and while attending, sporting or entertainment events in public assembly facilities.

TEAM is the result of a collaboration involving NHTSA, the National Basketball Association (NBA), the International Association of Auditorium Managers (IAAM), the National Automobile Dealers Association (NADA), Government Employees Insurance Company (GEICO), and CBS, Inc. The project was launched in July 1985 when representatives of these groups met in Chicago to formulate goals and lay the groundwork for achieving them. What emerged from the meeting was an agreement to develop and implement policies and practices for use by public assembly facilities in reducing the threat posed to patrons and the surrounding communities by intoxicated drivers. Six general goals were identified:

- To increase public awareness of the dangers of drinking and driving and to motivate drivers to make their communities safer
- To promote responsible alcohol service as well as other policies and practices that enhance the safety of patrons and reduce the potential liability to arenas, stadiums, and servers
- To foster an enjoyable entertainment atmosphere at public facilities by reducing the abuse of alcohol and other drugs by patrons
- To protect the well-being of patrons and citizens in the surrounding communities by reducing instances of drunk and drugged driving incidental to events at public facilities
- To inform and educate patrons about drunk- and drugged-driving risks and responsibilities, the advantages of seat belt use, and other actions that can be taken to reduce the threat and consequences of alcohol-related crashes
- To provide leadership in promoting community efforts to deter and prevent drunk and drugged driving and to increase safety belt use

Seven cities with NBA franchises—Cleveland, Dallas, Denver, Indianapolis, Sacramento, Salt Lake City, and Washington, DC—took part in the pilottesting of the TEAM program, according to Impellizzeri. As a first step, NHTSA representatives met with the arena managers and key staff in those cities in order to review each facility's policies and practices concerning alcohol service. A 56-item inventory was used to scrutinize policies on admissions, sales and vending, alternative transportation, and public information. As a result, procedures for handling most alcohol-related problems have been carefully spelled out. For example, at the Salt Palace Center in Salt Lake City (home of the Utah Jazz basketball team and the Golden Eagles hockey team), the new policies and procedures include the following:

- Patrons may not bring alcoholic beverages or containers (cans, bottles, coolers, etc.) into the arena. Patrons must return such items to their cars or submit them for confiscation.
- Loitering in parking areas and on the grounds is kept to a minimum by security and parking personnel.
- Any patron wishing to buy beer (the only alcoholic beverage sold by the Center's concessionaire) is "carded" if he or she appears to be younger than 26 years of age. Beer sales themselves are contingent upon the event in question and the crowd it is expected to attract. When beer is available, sales are stopped at the beginning of the last

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SA

Utah Jazz

period of basketball and hockey games.

- Fans' awareness of the Center's alcohol policies and of the hazards of drinking and driving is promoted through the use of signs at concession stands, the public address system, message centers, and the arena's animation board. This public awareness campaign is also carried outside the arena by taking advantage of the home teams' ready access to local mass media. NHTSA has developed a series of television PSAs—on the TEAM concept, designated-driver strategies, and intervention to prevent drunk driving—for use in Salt Lake City and the six other pilot sites.
- If intoxicated patrons are spotted, the Center's staff encourages them to accept an alternative to driving themselves home—a ride from a sober friend, bus, or taxi, for example. Drunken patrons who insist on driving anyway have their license numbers recorded and reported to the police.

The staff training necessary to put these policies into effect comes in several forms. IAAM and NHTSA have assembled a 4-hour training package for use at the seven pilot sites consisting of basic alcohol awareness information (statistics on drunk-driving crashes and fatalities, warnings about commercial host liability, concepts of alcohol equivalency and blood alcohol concentration, tips on recognizing impairment and intoxication, etc.); a thorough grounding in the policies and practices of the arenas; and instructions in intervening, i.e., how to refuse service to an intoxicated patron smoothly but firmly and how best to handle such patrons when the game is over and arrangements for a safe ride home must be made. (At the Salt Palace Center, concession personnel receive additional training in the server intervention curriculum developed by the Southland Corporation.) Periodic repetition of the training ensures that staff remain knowledgeable.

Brad Mayne, spokesperson for the Salt Palace Center, says their program has gone over well with fans, many of whom have sought him out to deliver unsolicited praise. "They appreciate the improvement in the environment," he says. He credits increased attendance at Center events—in what he describes as "a relatively small market"—in part to the TEAM program. The Salt Palace is so pleased with the reaction that it is setting aside a portion of the stands as a nondrinking section for use during hockey games, when the crowds often tend toward rambunctiousness.

TEAM is still in its fledgling stage, and Impellizzeri stresses the evolutionary nature of the project. Programs at the seven pilot sites are in different stages of development, and their personnel have consulted with one another to trade information and experiences. NHTSA's role, according to Impellizzeri, is to act as an educational catalyst and, to some extent, as a channel for the exchange of information. In addition to the policy evaluation mentioned earlier, NHTSA has conducted training at the test sites and has shared training materials with the arena management. NHTSA is also developing a handbook to guide administrators in the second phase of the project, which involves approaching key people in each locale and enlisting their cooperation in mounting community-wide alcohol-and-traffic-safety campaigns.

Once in final form, NHTSA's training package will be turned over to the 900-member IAAM for application or adaptation to concert halls, outdoor amphitheaters, and other settings. Ultimately, Impellizzeri hopes to persuade other NBA franchisees to avail themselves of the TEAM program—but sees no reason to stop with basketball. "The same problems come up at baseball and football games," he says. "Why shouldn't those fans also benefit by a pleasant environment and a safe ride home?" ■

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Social Host Liability

Kelly versus Gwinnell

Kurt Mulholland

On the evening of January 11, 1980, Donald Gwinnell of Middletown Township, NJ, drove away from the home of Joseph and Catherine Zak, where he had consumed an alleged 13 or more Scotches. Minutes later, while attempting to pass another car on a curve, Gwinnell's vehicle struck a car driven by Marie Kelly of Oceanport. As a result of the collision, Kelly suffered a broken ankle and jaw and lost six teeth. A blood test administered after the crash showed Gwinell to be legally intoxicated.

Kelly's subsequent lawsuit against Gwinnell, later amended to include the Zaks, led to a ruling by the New Jersey Supreme Court that "where the social host directly serves the guest and continues to do so even after the guest is visibly intoxicated, knowing that the guest will soon be driving home, the social host may be liable for the consequences of the resulting drunken driving." The ruling was handed down in June 1984. In February of the following year, Kelly's suit went to trial and was settled the same day. She collected $72,500 from the Zaks and $100,000 from Donald Gwinnell, the limit of his automobile liability policy.

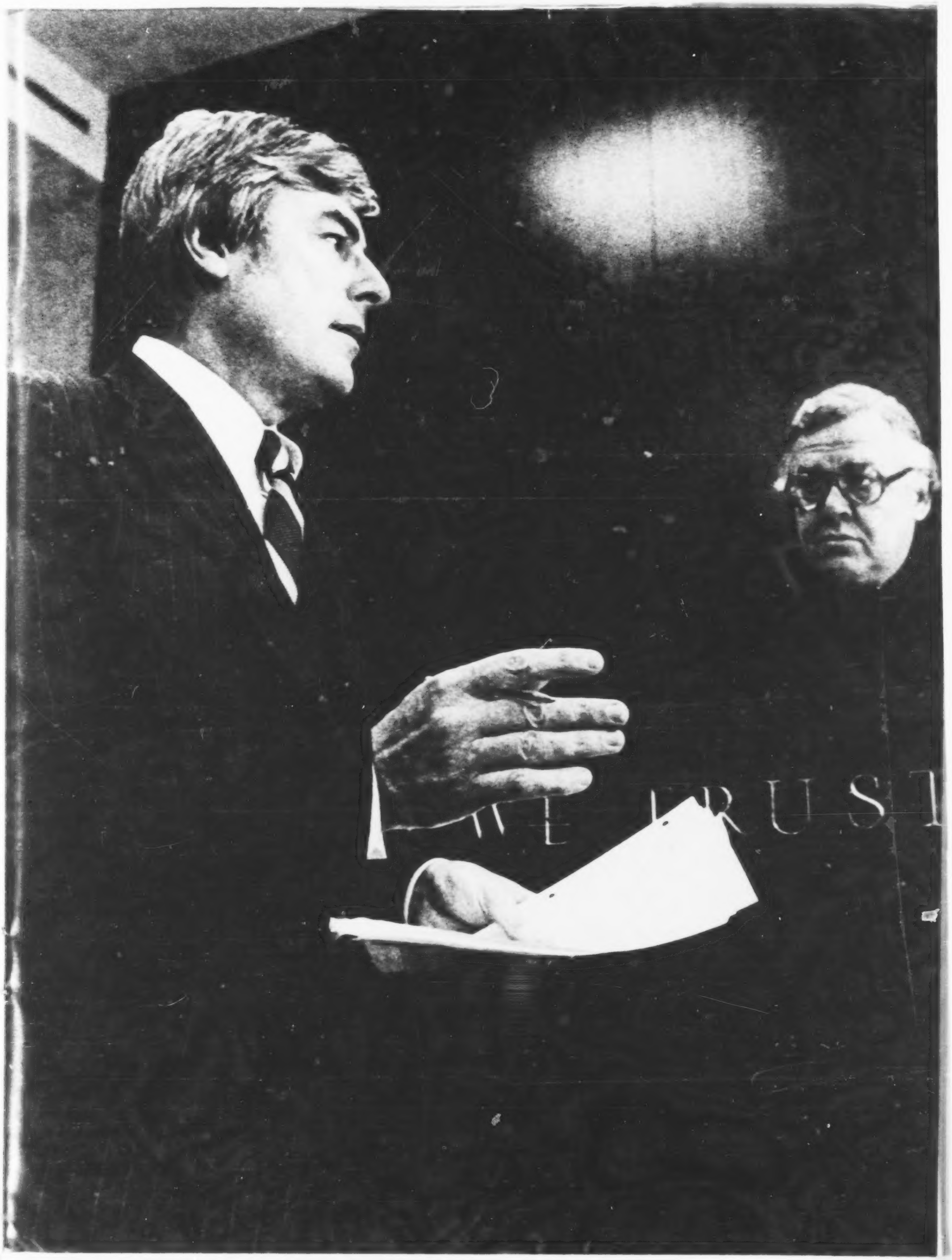
According to attorney George Chamlin, who represented Marie Kelly, the case is considered important because similar rulings in other jurisdictions have been set aside or nullified by legislative action. (The New Jersey legislature established a commission on alcoholic beverage liability in October 1984. The commission has recently issued recommendations calling for the legislature to take the issue out of the hands of the courts and define social host liability through legislation.)

The decision in the Kelly case has been controversial from the beginning. The New Jersey Supreme Court itself had a dissenting vote. Writing for the majority, Chief Justice Robert N. Wilentz was quoted by the Bergen *Record* as arguing, "Does our society approve of the decision to continue to allow the charm of unrestrained social drinking when the cost is the lives of others, sometimes of the guests themselves?" Associate Justice Marie Garibaldi dissented: "The imposition of this liability on a social host places upon every citizen of New Jersey who pours a drink for a friend a heavy burden to monitor and regulate guests. It subjects the host to a substantial liability that may be far beyond the host's resources."

Recent opinion polls by Media General-AP and Gallup suggest that the public has little enthusiasm for the notion of social host liability. In both polls, nearly two-thirds of those questioned said they disagreed with the New Jersey ruling. (A third poll, conducted in February 1985 by Harris, asked if bartenders or owners should be held liable if a patron leaves drunk and later kills or injures someone. Fifty-five percent of the respondents said no.)

The Kelly ruling applied only to small social events where the hosts actively serve guests and only when the host knows a guest will be driving later, according to Wilentz. But a later New Jersey case, settled out of court in 1985 for $1.7 million, implicated a young woman who attended a "bring your own" party and subsequently drove away, ran a stop sign, and struck another car, injuring the driver. The young woman, the party's host, and the owners of the house where it was held all contributed to the settlement. The victim's attorney was quoted in news reports as warning hosts to be aware of the trend toward an "expanding interpretation" of their liability for guests. To date, 12 States—Colorado, Georgia, Illinois, Indiana, Louisiana, Michigan, New Jersey, New Mexico, Oregon, Pennsylvania, Washington, and Wisconsin—provide for at least a limited cause of action against social hosts for injuries caused by their intoxicated guests. Other States are considering legislation to similar effect. ■

—Thomas Prugh



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Tips for Responsible Social Hosting

As *Kelly v. Gwinnell* and other cases illustrate, the responsibilities of serving alcoholic beverages are complex. The legal liability of social hosts varies from one State to another, but many hosts and hostesses have sought information on how they can plan and carry out safe parties.

Listed below are a few simple guidelines, compiled from a variety of published materials, that social hosts can follow to reduce the risks associated with serving alcohol at parties. A parallel set of commonsense suggestions for guests is included as well. Information about the laws in each State that affect social host liability may be obtained from the legislative reference bureau or the office of legislative counsel (attached to the State legislature), or from the office of the State's attorney general.

Guidelines for Social Hosts

- Do your best to establish and maintain a tension-free atmosphere. Guests should not have to drink in order to relax.
- Have food available before and during alcohol service, but avoid salty foods that promote thirst. High-protein foods—shellfish, meatballs, and chicken, for example—are best at slowing the absorption of alcohol.
- Do not have an open bar. Deemphasize alcohol by putting the bar someplace out of the way. Serve your guests yourself or hire someone to do it. In either case, measure the alcohol carefully and use light doses.
- Have an attractive variety of nonalcoholic beverages on hand and make them at least as easily and prominently accessible as the alcoholic drinks. If you are serving mixed drinks, be aware that noncarbonated mixers retard the absorption of alcohol into the bloodstream while carbonated mixers speed it up.
- If the event is a dinner-and-drinks affair, keep the drinking period short and have hors d'oeuvres available throughout.
- Don't push drinks. Respect your guests' right to refuse drinks. Make sure that nonalcoholic beverages are available during dinner as well as before.
- Never serve alcohol, or allow it to be served, to a guest who seems to be intoxicated.
- Stop serving alcohol at least an hour before the party is over.
- If, despite these precautions, a guest drinks to the point of impairment (not necessarily drunkenness) and you are not certain he or she will be driven home by a sober companion, then drive the guest home yourself, arrange for a taxi, or put him or her up in your home for the night. *Never let a guest drive away intoxicated.*

Guidelines for Guests

- Support and cooperate with your host's or hostess' efforts to make the event safe and pleasant for all.
- Do not hesitate to exercise your right to refuse drinks or to avoid alcoholic beverages altogether.
- If you choose to drink, moderate your intake. If you arrive with a group, arrange for one member to take responsibility for doing the driving. That person should not drink alcohol on that occasion.
- Be aware that, while most people can metabolize about one standard drink every hour (a standard drink is one 12 oz. can of beer, 5 oz. of wine, or 1.5 oz. of spirits), metabolic rates vary. In general, women are more readily affected by alcohol than men are, because of lower average body weight, different tissue composition, and other factors.
- If a woman is pregnant or nursing, the safest decision for her and her baby is not to drink.
- Partygoers taking medication should be aware that many drugs—both prescription and over-the-counter—can interact with alcohol to produce unpleasant or even dangerous side effects. If in doubt, consult your physician or pharmacist. ■

—Thomas Prugh

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Point-of-Purchase Health Warning Notices

Should the vendors of alcoholic beverages be responsible for warning customers, particularly pregnant women, of the dangers of drinking? Several communities in the United States have decided that they should, at least in some circumstances.

Since December 1983, at least five cities—New York, NY; Philadelphia, PA; Washington, DC; Columbus, OH; and Clearwater, FL—have passed ordinances requiring all vendors of alcohol to post conspicuous signs notifying consumers of the link between drinking during pregnancy and the incidence of birth defects. Similar efforts are currently under way in the State of Maine, and in the cities of Los Angeles, CA, and Monroe, LA.

The message is generally simple. Example: "WARNING: DRINKING ALCOHOLIC BEVERAGES DURING PREGNANCY CAN CAUSE BIRTH DEFECTS."

The ordinances are an outgrowth of the widening concern for the prevention of alcohol-related birth defects, especially fetal alcohol syndrome (FAS). In 1981, the U.S. Surgeon General issued an advisory cautioning women who are pregnant or considering pregnancy not to drink and to be aware of the alcohol content of foods and drugs. The advisory was prompted by an increasing body of medical research indicating that consumption of alcohol during pregnancy can produce a characteristic set of birth defects (FAS) that includes central nervous system dysfunction, prenatal and postnatal growth deficiency, facial abnormalities, and organ system malformation. Alcohol consumption during pregnancy also is thought to be the cause of a variety of other related birth defects. The incidence of FAS in the United States is not known with certainty, but studies suggest that it ranges between 1 and 3 cases per 1,000 live births. Because no assuredly safe level of alcohol consumption has been established, public health officials agree that the safest policy is simply not to drink at all while pregnant.

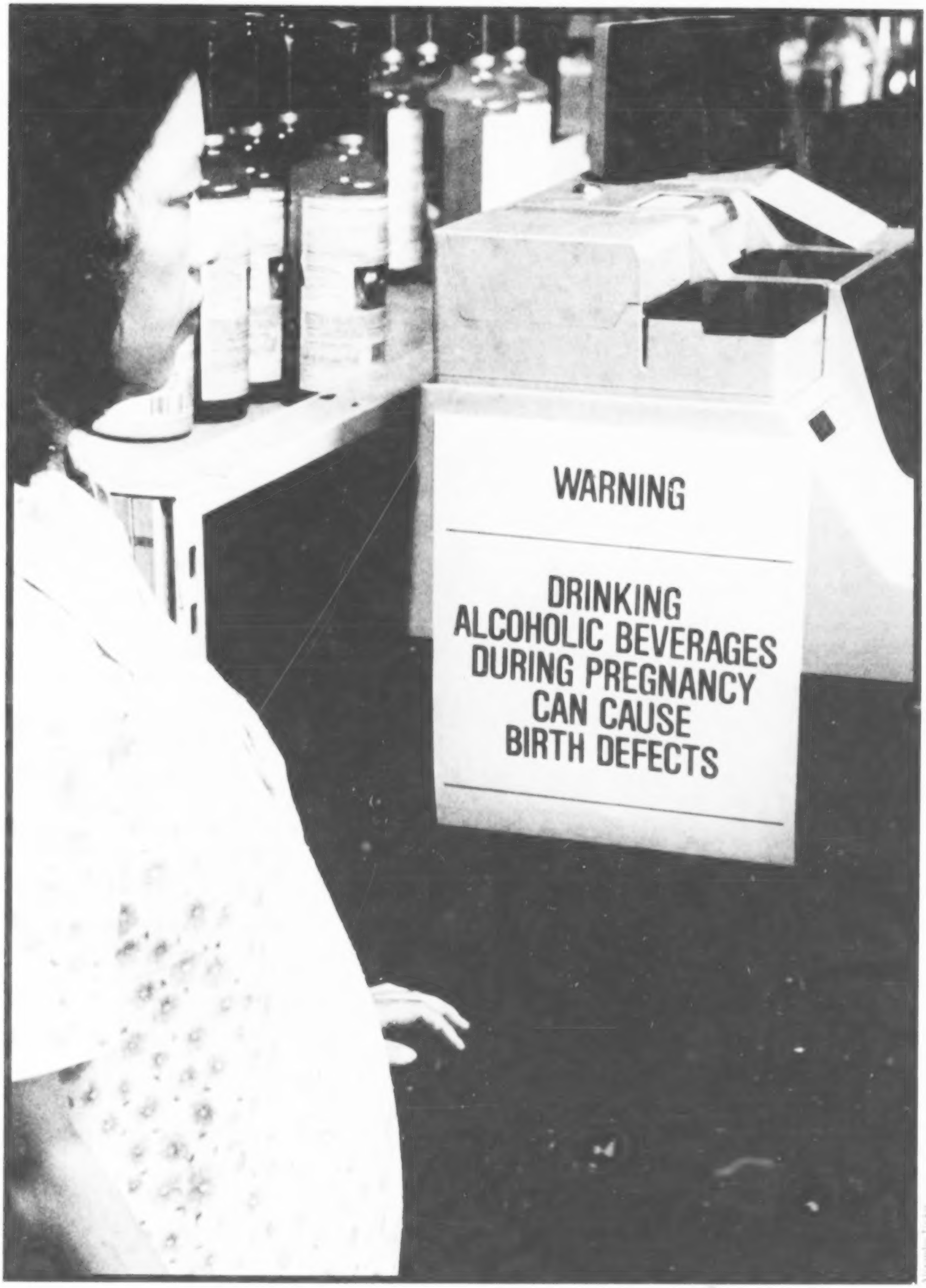
The campaigns have sometimes aroused opposition.

The sign-posting efforts have, in some locales, been augmented by additional public information measures. In Philadelphia, for example, the signposting was coordinated with a media campaign, the proclamation of an "FAS Week," the establishment of an FAS information hotline, and the distribution of literature to specialists in obstetrics and gynecology as well as to personnel in maternity and infant care programs.

The campaigns have sometimes aroused opposition. New York's groundbreaking plan to require warning signs in each of its 8,000 alcohol-vending sites triggered opposition lobbying from the liquor industry, the local chapter of the State restaurant association, and the Chamber of Commerce and Industry, according to reports in the *New York Times*. In Philadelphia, an opponent writing in the op-ed pages of the *Philadelphia Inquirer* argued that "the 'post-a-notice' approach legislated by City Council . . . will likely place pregnant women under unnecessary scrutiny more so than it will affect [sic] any change in an alcohol abuser's habits" and "the solution . . . is narrow in approach and unnecessarily singles out pregnant women without a realistic expectation that behavior will actually be modified." Nevertheless, the Philadelphia council voted unanimously in favor of the ordinance. In New York, the vote was 28 to 4 in favor of the warning signs.

Some evidence of the posters' effectiveness has been collected. The New York City health commissioner sponsored two Gallup polls, one conducted just before the warning signs went up and a second 12 months later, that were designed to assess respondents' "unaided awareness" of the alcohol-birth defect link. In the first poll, 54 percent of all those interviewed spontaneously mentioned alcohol consumption as a potential cause of harm to an unborn child. A year later, this figure had risen to 68 percent. Of particular interest was the improvement in men's unaided awareness, from 53 percent in the first poll to 67 percent in the second. According to Allan Luks, executive director of the Alcoholism Council of Greater New York, the figure "rebuts critics who said the warning only targeted women." Luks, whose organization proposed the law, further argues that "this poll shows that information at the point of sale can affect the thinking of alcohol buyers. The public wants to be informed about health impacts of drinking." ■

—Thomas Prugh


WARNING
DRINKING
ALCOHOLIC BEVERAGES
DURING PREGNANCY
CAN CAUSE
BIRTH DEFECTS

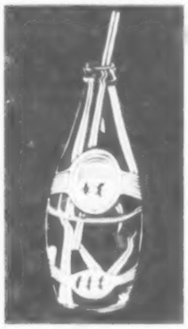
Alexander Tsiaras

Perspectives

***Editor's Note:** Notions about server responsibility are currently in a state of flux and are marked by a wide diversity of opinion. In order to sample some of these viewpoints and to illustrate their diversity,* AH&RW *asked representatives of the alcohol field, the legal and insurance professions, the alcohol beverage industry, and the hospitality industry to respond to two questions: (1) What are (or should be) the responsibilities of business, commercial and social hosts, government, and drinkers themselves in ensuring that the least possible harm comes to the public from the abuse of alcohol? and (2) What must each group do, in terms of policies and practices, to meet its requirements?*

Our respondents' commentaries are presented below. They do not necessarily reflect the views or policies of the National Institute on Alcohol Abuse and Alcoholism.

***Doris Aiken** is founder and president of Remove Intoxicated Drivers (RID)-USA, Inc., in Schenectady, NY.*



We all have a basic duty to protect ourselves, our families, and the public from damages caused by abuse of alcohol. We can all be helped to perceive that duty clearly when media, government, and the victims hold up to view the consequences of alcohol abuse and impairment, publicly, in every possible way.

Because alcohol is so entwined with business lunches, entertainment, and hospitality, business has a responsibility to have ongoing programs for employees that have real teeth in them. Those recognizing an alcohol problem in themselves need, and should obtain, help from their employer. The employer must have sent out the word that no help, and possibly a dismissal will follow a drunk-driving event with a company car; that company parties will provide for safe rides home or will not serve booze; that the bar is a cash bar and will close early; and that the company will not cover up or countenance any cover-up of an employee's abusive drinking. New Jersey and other States have determined that social hosts may, in some circumstances, be held responsible for damages done by a guest who leaves the party drunk. Therefore, hosts should make attractive nonalcoholic drinks as available as alcoholic ones, should have plenty of high-protein foods available, should have a bartender measuring drinks, and should not have "bring your own booze" affairs where control of the alcohol is in a guest's hands. No after-dinner drinks should be served, and no drunk person should be allowed to leave the party and drive. If a guest is stubborn, the host should call the police. If hosts act in this manner, suits will not easily be won against them.

Those who are licensed to serve the public should know that they are liable in most States for the damages done to a third party and, in some cases, to patrons if the patrons are served the last intoxicating drink in a bar. Bar owners must make a concerted effort to train their employees, to keep the lights up so that drunkenness can be observed, to make no "last calls" so that patrons overdrink just before leaving, to keep high-protein food on the menu and a breathalyzer on the premises, to serve nonalcoholic sodas or water to those who are designated drivers or who ask for these drinks, and to offer food and entertainment as key draws rather than happy hours or discounted drinks.

Advertisements should not "romance" drinking as a cool, upward-bound sexy lifestyle. Counterads depicting the "rest of the story" should be aired by the broadcast media. I am pleased that the National Association of Broadcasters has now agreed, voluntarily, to ask for a commitment from stations to air such public service announcements.

Lawmakers and civil servants should work together to get the facts, disseminate them widely in their newsletters, and work to help the public understand the rampant and tragic problem of alcohol abuse on the road and at home. Alcohol in all forms should be heavily taxed, to lower both the national deficit and the use of alcohol. PSAs with credible spokespersons should be produced by governments to bring the victims' faces and stories directly into the public eye. Lawyer-legislators must face up to their duty to close the loopholes in the laws that deprive the victims of justice, including an offending driver's privilege of refusing a BAC test after an accident.

Finally, all of us must accept the basic duty to know how many drinks we can have before becoming impaired and to

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Alcohol Health & Research World

Fall 1986
Volume 11
Number 1

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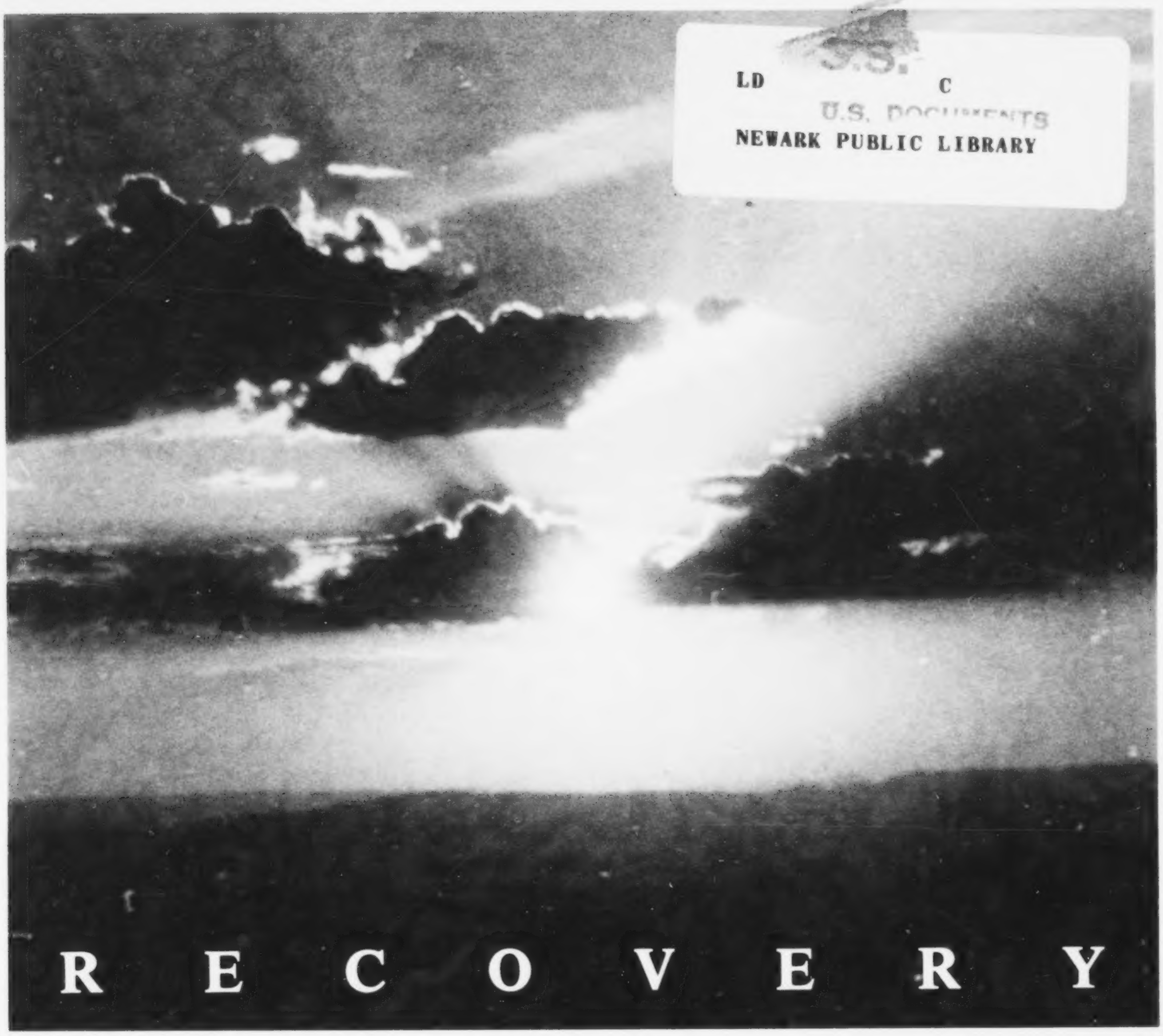

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Alcohol Health and Research World (ISSN 0090-838X) is a quarterly produced by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) through the National Clearinghouse for Alcohol Information, operated under contract number ADM 281-84-0005 by InterAmerica Research Associates. Terry Freeman is the Project Officer for the Clearinghouse. The Secretary of Health and Human Services has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through September 30, 1986. Opinions expressed in contributed articles do not necessarily reflect the views of NIAAA. The U.S. Government does not endorse or favor any specific commercial product or commodity. Trade or proprietary names appearing in this publication are used only because they are considered essential in the context of the studies reported herein. Manuscripts concerning research, treatment, or prevention of alcoholism and alcohol problems are solicited and should be sent to the Editor, *Alcohol Health and Research World*, P.O. Box 2345, Rockville, Maryland 20852. Subscriptions and changes of address should be sent to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Subscriptions are $12.00 a year or $15.00 if mailed to a foreign address. Single copies are available at $3.25 ($4.06 to a foreign address). These prices are subject to change without notice. Unless otherwise noted in the text, all material appearing in this magazine is in the public domain and may be reproduced or copied without permission. Citation of the source is appreciated.

FROM THE EDITOR

There is a growing awareness today of the importance of recovery from alcohol problems. For many, recovery is viewed as a gift bestowed anew with each day of sobriety. It is an experience shared not only by newly sober alcoholics but also by family members and friends who may emerge with renewed joy and security in their relationships.

Of course, if relapse occurs, it sends the alcoholic, family members, and friends on an emotional roller coaster that can throw off balance the support system so necessary for the reestablishment of a life of sobriety. But for those who ask for help and who have the support of loved ones and a network of fellow sober alcoholics, the dawn of a new day in the light of sobriety celebrates life awakened and, for many, a revival of spiritual values as well.

Such profound changes in one's life are possible only after the personal decision not to continue drinking has been made and help is sought. Typically, a range of recovery services supports the alcoholic through the initial stage. In some cases, detoxification and medical care are required. After successfully facing this transitional period, the patient emerges into the initial stages of recovery.

Today, several forces are converging to make recovery from alcoholism more possible and more accessible to increasing numbers of people. First, alcohol research not only is yielding clues as to the nature of the disease of alcoholism, it also is helping to develop more effective treatment strategies. Second, alcoholism treatment and a wider variety of services to support recovery are more available today than ever before, and these may work to increase the individual's chances of establishing and maintaining long-term sobriety. Third, those who are in recovery today can benefit from research findings and acquire an improved understanding of the process. Whether through formal treatment, self-help groups, or a combination of care and support systems, people in recovery can use this information to take more responsibility for their personal progress and health.

Specific articles in this issue focus on coping with the craving for alcohol, relapse prevention, and overcoming problems in predicting a patient's chances for successful recovery. Other articles examine such topics as the phenomenon of spontaneous remission from alcoholism; the usefulness of fitness and nutrition components in recovery programs; vocational rehabilitation; minority issues; needs of recovering women; techniques for the recovering person to use in parenting; and biomedical advances in reversing the complications of alcoholism.

It is evident in the articles that follow that to examine the many issues surrounding recovery is to focus on people. And so, most of these articles reflect the daily personal and family struggles and triumphs of people in the recovery process. While these struggles are often long and difficult, and not without "slips," recovering individuals today have as their allies teams of scientists and alcohol professionals dedicated to delivering needed services that help people attain long-term sobriety and good health.

RECOVERY—BEGINNING OF A BEGINNING

The very thought of going out to dinner without having several "before-dinner drinks" to whet my appetite was repulsive.

The idea of cutting the lawn without at least stopping for four or five nice, cold beers was absolutely revolting.

Watching television would be totally boring without a glass of Scotch and water in my hand.

It just didn't matter that consuming so many before-dinner drinks often meant I didn't have dinner at all, or that because of the cold beers the lawn frequently did not get cut, or that I never saw much television anyway with the Scotch in my hand—or spilled on the carpet.

No, it didn't matter at all. What *did* matter was that I was frightened by the thought *of a life without booze—of not being able to* take another drink again for as long as I lived. I was uncomfortable with being different, even though I had accepted the fact that I was different. I was an alcoholic.

These feelings were strong, even in the second and third year of my recovery. I avoided dances and parties and other social functions. I felt it would be impolite to invite guests to the house without serving alcoholic refreshments. So, I didn't have guests at home. For a long time, I isolated myself from just about everything, except family and close friends.

Somewhere between the third and fourth year, I discovered that there was life after sobriety: that I could dance and sing and be happy without a drink. Without alcohol, I found I could remember dancing and singing and being happy the next day, and even the next month, and the next year.

If there is one thing that helped me more than anything else to make that adjustment, *it was rediscovering the religious values I* had been taught in my youth—values that I had lost in the bottle, along with my self-respect, and my respect for others. Of course, I can only speak for myself. It works differently for everyone.

But it was only through this spiritual rebirth that I was able to accept those things that I could not change, that I was granted the courage to change those things I could, and that I received the wisdom to know the difference.

Knowing I never have to drink again for as long as I live gives me serenity.

—LEROY P.

When I first decided to stop drinking, I thought the central struggle would revolve around whether I took that next drink, and the chief benefit of resisting the impulse would be never again *wondering what fool thing I had done the* night before.

I haven't had a hangover in almost 5 years and I haven't had to apologize to anyone

for an act I didn't remember committing in all that time either. For both of these I am grateful. But more importantly, I am grateful for the new sense of self-respect I have gained—a self-respect that was founded on the initial decision not to drink and was fortified by the thousand other decisions that have followed.

If I had to describe my experience of recovery from alcoholism, I would select words like freedom, courage, pain, joy, awakening. The process was initiated by attaining sobriety, but I'm not so certain about the conclusion. If there is an end to the process, I haven't reached it yet.

When I was newly sober, all I had to do was not to drink. I had to allow myself the freedom not to expect more. Asking more was foolhardy anyway. Most things were simply too hard for me. It was too hard to be at parties, so I didn't go. It felt unsafe to get too close to another person, so I maintained a single lifestyle. I was afraid of the consequences of pushing myself professionally so I stayed in a job I didn't like very much because it didn't require very much of me. I had an overwhelming sense that if I wanted to stay sober, I had better not rock the boat.

As my expectations rose, I gradually became dissatisfied. I wanted to test myself to see who I really was, and I had to find the answers to some nagging questions. In many ways, I mark this experimental urge as the beginning of recovery. Drinking had allowed me to skirt pain and to pretend I liked myself better than I did. But it also made me rigid and afraid of taking risks. To step out of the frame in which alcoholism was an acceptable escape meant dropping those pretenses and confronting the self-hate that had always haunted me. That left me undefended against those fears of my inadequacy. It took all the courage I could muster to face those days without any guarantees that those doubts would ever abate.

Recovery has not been an easy or altogether pleasant process. But it has become easier with time, and it does have many rewards. I have come to appreciate the distance I traveled in those 5 years and to savor the small pleasures that a chemical-free lifestyle permits. I can take pleasure in a healthy body and discover its possibilities—I became a jogger at the age of 33 and ran my first marathon at 36.

The other, less tangible satisfactions are not so easily won. Love, achievement, and personal growth require flexibility; a willingness to take risks; a faith in one's own instincts; the permission to make mistakes; and a recognition that those mistakes are learning opportunities, not proof of inadequacy. Each success provides the foundation for subsequent growth. But without the first step—sobriety—none of the rest is possible.

—ARLEEN R

Relapse Prevention Planning

A New Recovery Tool

Terence T. Gorski, M. A.

Relapse during recovery from alcoholism continues to result in high percentages of adverse treatment outcomes. Current treatment approaches have been ineffective in dealing with certain types of cases, which appear to be relapse-prone. Because these patients tend to reenter treatment after successive bouts of drinking, the proportion of problem cases in treatment programs is rising. This article presents a new model, based on concepts from two widely accepted models of relapse and recovery, that will assist in improving rates of positive treatment outcomes. This approach calls for placing the phenomenon of relapse in its proper perspective within the recovery process, planning for the likelihood of relapse, and providing patients with skills to cope with the stresses that typically lead to the resumption of alcohol and other drug use.

The Extent of the Problem

Relapse is a serious problem facing the alcoholism treatment field. Recovery rates for inpatient programs treating patients with good prognoses (high socioeconomic status and social stability) are between 32 and 68 percent, while in the other programs, patients with poor prognoses (largely skid row alcoholics) have recovery rates ranging only up to 18 percent (Baekeland et al. 1975). Between 50 and 60 percent of treated alcoholics tend to experience relapse within the first 3 months after treatment (Hunt et al. 1971). The studies of lifelong alcoholism recovery patterns suggest that 10 to 20 percent of alcoholic patients never relapse after their first serious request for help and that an additional 2 to 3 percent will achieve stable sobriety with each additional year of attempted abstinence (Vaillant 1983).

Classification of Recovery/Relapse History

The clinical experiences of the author indicate that recovering alcoholics can be classified into three groups, based upon their recovery/relapse histories: recovery-prone, transitionally relapse-prone, and relapse-prone. This observation is supported by a review of the natural history of the recoveries of treated alcoholics (Vaillant 1983). Approximately 40 percent of all patients attempting recovery are *recovery-prone.* A small number of these individuals manage to maintain long-term abstinence with no treatment or self-help group attendance. Others recover without receiving professional treatment but use Alcoholics Anonymous (AA) or related self-help groups to support their abstinence (Vaillant 1983). Still others seek professional help and maintain long-term sobriety after their first treatment.

The members of the second group, approximately 20 percent of all recovering persons, are *transitionally relapse-prone.* These persons periodically relapse, in spite of involvement in both professional treatment and AA or other self-help groups. Over time, their relapse episodes become farther apart, shorter, and less severe. While periods of abstinence become longer and are characterized by improvements in the quality of personal functioning, transitionally relapse-prone patients seem to have the capacity to learn from past relapses. They appear to acquire recovery skills progressively, on a "trial and error" basis. Within 3 to 5 years, these patients achieve long-term abstinence and healthy levels of personal functioning.

The remaining 40 percent of alcoholic patients are *relapse-prone.* These patients will develop a progressive pattern of periodic alcoholism. The relapse episodes become more frequent, longer, and marked by more severe consequences. These patients experience progressively lower levels of functioning during periods of abstinence. Many of them will die of alcoholism within 17 years of their first treatment.

Relapse-prone patients can be further divided into two distinct subgroups. Those in the first subgroup, *unmotivated relapse-prone patients,* in spite of initial treatment, fail to recognize or accept that they are suffering from alcoholism. As a result, they refuse to adhere to a recovery program requiring abstinence, physical and psychological rehabilitation, and lifestyle change. In these cases, the treatment fails to motivate these patients to interrupt their disease progression.

The second subgroup, *motivated relapse-prone patients,* recognize that they are alcoholics and require an ongoing recovery program. Attempting to maintain long-term abstinence, they use AA or other self-help groups and ongoing treatment. They also make sincere attempts at psychological and physical rehabilitation and attempt recommended lifestyle changes during abstinence. Despite their efforts, however, these individuals fail to maintain long-term recovery.

This mountaineer is equipped to guard against a fall. Planning and skill training equip the recovering alcoholic for relapse prevention.

Forest Service, USDA

Forest Service, USDA

YELLOW JACKET
YELLOW JACKET

In middle recovery, the patient develops a balanced lifestyle through reestablishment of relationships.

National Archives

There is a common mistaken belief that most relapse-prone alcoholics are not motivated to recover. Clinical experience has not supported this perception. The vast majority — in excess of 80 percent of all relapse-prone patients — appear to recognize their alcoholism. They strongly desire to interrupt its progression, but are unable to do so regardless of how hard they try or which form of treatment they choose.

INCREASING PROPORTIONS OF RELAPSE-PRONE PATIENTS IN TREATMENT

As a result of these patterns of recovery, alcoholism treatment programs will continue to encounter more relapse-prone and transitionally relapse-prone patients. The numbers can be expected to increase dramatically over the next 10 years. An informal survey of treatment centers conducted by the author in 1979 indicated that 20 percent of the private sector treatment beds were occupied by patients previously treated in 21- or 28-day alcoholism rehabilitation programs. When this survey was again conducted in 1985, this proportion had risen to over 40 percent. The increase in relapse-prone patients in public sector programs is also alarming. Some programs that treat patients in the late chronic stage of the disease report that 60 to 80 percent of their patients were treated previously and are relapse-prone.

RELAPSE AND RECOVERY MODELS

Different models are used to explain recovery and relapse for alcoholism. The three most common are the controlled drinking model, the abstinence model, and the biopsychosocial dysfunction model. The developmental model also addresses issues of recovery.

Controlled drinking has been proposed as a viable outcome for the treatment of alcoholics; yet, there is no evidence that controlled drinking is a practical treatment goal for persons who have been physically dependent upon alcohol (i.e., meet DSM-III criteria for alcohol dependence). The cases of apparent success of controlled drinking appear to be related to treatment of alcohol abusers who were not exhibiting physical dependence (Pendery et al. 1982). A recent 5-year followup of 1,289 alcoholics reports that only 1.6 percent of them were able to maintain a moderate drinking level (Helzer et al. 1985). Thus, the controlled drinking model does not appear to be an acceptable basis for defining recovery from alcoholism.

The abstinence model has been the traditional measure of successful outcomes in disease model programs. If patients use alcohol or drugs after treatment, they are said to be in relapse; if not, they are said to be in recovery. Thinking about using alcohol or drugs and the return of the compulsion to use them are viewed as relapse warning signs. Although in widespread use, this model has limitations in that it fails to measure a variety of factors other than alcohol and drug use that significantly affect recovery and relapse. Although this model is preferable to controlled drinking, it is of limited help in preventing relapse.

The biopsychosocial dysfunction model of relapse has been emerging in clinical practice since the early 1970s and has been well defined in the recent literature (Donovan 1986; Donovan and Chaney 1985; Gorski and Miller 1986). Abstinence plus a full return to biopsychosocial functioning is the indicator of successful recovery. Relapse is defined as the process of becoming dysfunctional in recovery. The dysfunction may involve alcohol or drug use; or it may be a sobriety-based dysfunction, including physical or psychosocial collapse. The typical relapse progression moves from biopsychosocial stability through a period of progressively increasing psychosocial distress to physical or emotional collapse. The symptoms continue to intensify unless the patient turns to use of alcohol or drugs for relief.

This model defines a broad base of factors that are associated with recovery and relapse. It permits development of a patient profile based on a variety of factors and it allows for specific treatment plans to be developed to reverse each of the factors that create risk.

The developmental model contributes to our understanding of recovery by defining it as a developmental process requiring between 4 and 7 years. During the process, a patient will begin to acquire fundamental recovery skills. Over a period of time, more complex skills that build upon the basic skills developed in early recovery will be acquired. This process has been conceptualized as having six developmental periods. During each of these periods, relapse is possible in terms of either alcohol/drug use or sobriety-based dysfunction. The primary causes of relapse will be different during each period.

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The Need for a Relapse-Prevention Planning Tool

Although both the biopsychosocial and developmental models provide concepts that are helpful in understanding the processes of relapse and recovery, neither serves as an effective planning tool that will assist in treating the growing number of relapse-prone patients. I would like to propose a new model incorporating concepts about relapse and recovery from both models. It provides a conceptual framework that will be usable within treatment centers. Studies on the etiology of alcoholism (Donovan 1986), the natural history of recovery (Brown 1985; Vaillant 1983), and the relapse process (Gorski and Miller 1982; Marlatt and Gordon 1985) have made possible the development of this new model. The phases of recovery—derived from the developmental and biopsychosocial models—are linked with relapse prevention planning.

The Pretreatment Period

Pretreatment begins the first time a person experiences an alcohol-related problem. It progresses through a series of strategies designed to control use, and it ends with recognition by the person that safe use of alcohol or drugs is no longer possible. The struggle for control is a symptom of a fundamental conflict over personal identity. Alcoholics enter this phase of recovery believing they are normal drinkers who are capable of control. As the progression of addiction causes more severe loss of control, they must redefine their personal identities as addictive users who are not capable of control (Brown 1985).

During the pretreatment period, the alcoholic will typically attempt both periods of controlled use and periods of abstinence. These periods of abstinence are always time-limited and have an underlying goal of allowing the patient to recover sufficient strength to return to controlled alcohol use in the future. The major cause of relapse during this period is the testing of personal control.

The Stabilization Period

During the stabilization period, alcoholics recognize that they are addicted users who can no longer safely use alcohol or drugs. When they attempt to stop, however, they experience distress in the form of physical withdrawal symptoms, anxiety related to the interruption of psychosocial dependency, and the emergence of long-term or post-acute withdrawal symptoms. Patients often find themselves unable to cope with the stress and pressure of these symptoms. They often use alcohol and drugs to relieve such distress. The major cause of relapse during the stabilization period is the lack of withdrawal management skills.

The Early Recovery Period

Early recovery is marked by the need to establish a recovery program that provides a social structure supportive of long-term sobriety and offers opportunities to learn about the addictive disease process. Patients must develop effective nonaddictive coping strategies for dealing with the life problems created by the alcoholism and for managing day-to-day stress. The primary cause of relapse during this period is the combination of direct social pressure to use alcohol; the absence of effective, sobriety-based coping skills for dealing with serious life problems; and the buildup of chronic daily stress.

The Middle Recovery Period

Middle recovery is marked by the development of a balanced lifestyle. The recovery program is modified to allow the patient time to reestablish relationships with family and friends and to initiate new friendships that are part of naturally occurring life activities. This is a time of stress as the person begins applying basic recovery skills to real-life problems. The major cause of relapse during this period is the stress of life change.

The Late Recovery Period

Late recovery is the time when a lifestyle that is balanced between recovery activities and normal, stable life activities is established. With middle and early recovery as a foundation, patients begin working on improvements in the quality of personal functioning. This involves the development of a healthy, functional personality and the resolution of any distorted attitudes or beliefs that were developed in childhood. The major cause of relapse during this phase of recovery is either the inability to cope with the stress of unresolved childhood issues or evasion of the need to develop a functional, low-stress personality style.

The Maintenance Period of Recovery

The physiology of addiction persists for the rest of a person's life. Any use of alcohol or drugs will reactivate previously damaged physiological processes. There also are powerful learned or conditioned responses associated with alcohol and drug use that can be reactivated with loss of control. During the maintenance period, persons must maintain awareness that they are alcoholic and cannot safely use alcohol or drugs. They must guard against relapse warning signs, continue to live productively, and strive to actualize sobriety-centered values within their lifestyles.

"Stuck Points" in Recovery

Although some patients progress through the stages of recovery without complications, the majority of recovering alcoholics do not. Most alcoholics get stuck somewhere in midstream. A "stuck point" can occur during any period of recovery and generally is caused either by the refusal or inability to complete recovery tasks or by the development of special problems that interfere with progress in recovery.

When patients encounter "stuck points," either they will recognize that they have a problem and take action, or they will deny that a problem exists. If patients deny that problems exist, stress will begin to build. Eventually, the stress will reach an intensity sufficient to trigger a state of internal dysfunction.

Precipitating Factors—Trigger Events

A precipitating factor or trigger event is any internal reaction or external event that causes a person to develop symptoms of internal dysfunction while sober. The internal reactions that trigger dysfunction may consist of irrational thoughts, distressing emotions, painful unresolved memories, or projections of catastrophic future events. The external events that serve as precipitating factors may include any situation or interpersonal interaction for which the person lacks coping skills.

The buildup of chronic stress can act as a precipitating factor by itself. Many patients with high-stress personalities and lifestyles who lack effective stress-management strategies will experience episodes of sobriety-based dysfunction in the absence of any identifiable psychosocial stressors.

For some patients, relatively small events may trigger dysfunction; for others, major psychosocial stressors are managed with no resulting dysfunction. The different reactions appear to be influenced by a number of predisposing factors that can either increase or lower the risk of becoming dysfunctional in sobriety.

PREDISPOSING FACTORS

A predisposing factor is any lifestyle or personality factor that lowers a person's resistance to stressors. Five common factors appear to predispose a person to sobriety-based dysfunction. These are a high-stress personality or lifestyle; social conflict or instability; poor health maintenance (improper diet, lack of exercise and rest, and improper treatment of coexisting illness); multiple diagnoses; and an inadequate recovery program. The more of these risk factors present in a patient's life, the less stress will be required to cause an episode of sobriety-based dysfunction. Patients appear to be able to inoculate themselves against the risk of relapse by systematically lowering these risk factors (Marlatt and Gordon 1985).

THE INTERNAL WARNING SIGNS OF RELAPSE

For the motivated patient, relapse is caused by a complex interaction of biological, psychological, and social factors that cause progressive dysfunction before the alcoholic begins addictive use. This dysfunction is both internal and external. The internal dysfunction includes the inability to think clearly, recognize and manage emotional states, remember things, consistently control psychomotor coordination, sleep restfully, and manage stress. This internal dysfunction, if not effectively managed, leads to external dysfunction that includes increasingly severe problems in all areas of life.

The states of internal dysfunction appear to result from subtle brain dysfunction aggravated by psychosocial stress. There is substantial evidence of longlasting, subtle brain dysfunction in sober alcoholics that ranges from moderate to severe and persists for extended periods of time (Porjesz and Begleiter 1983). The more severe the brain dysfunction, the more susceptible the alcoholic will be to the debilitating effects of acute or chronic psychosocial stress.

THE EXTERNAL WARNING SIGNS OF RELAPSE

If the warning signs of internal dysfunction are inappropriately managed by the patient, symptoms of external dysfunction will begin to appear. This will include the emergence of problems related to work, social, family, and intimate functioning. The external dysfunction typically follows a 10-step progression that begins with denial of the internal dysfunction and avoidance or defensiveness about any indicator of the internal dysfunction.

This denial of sobriety-based dysfunction leads to the development of additional life problems and crises. Although efforts are made to resolve each problem and crisis, these efforts fail because the underlying source of internal dysfunction has not been addressed. This problem results in a state of chronic high-stress living that further aggravates the internal dysfunction that is based in part upon brain dysfunction. The situation ultimately leads to immobilization, confusion, and depression.

Patients experiencing problems as a result of internal dysfunction next begin to exhibit overt loss of control over behavior. Their denial breaks, and they recognize the extent of their loss of control. As a result, patients believe that their personal options are reduced to only three ways of coping with pain and problems: suicide, physical or emotional collapse, or self-medication through use of alcohol and drugs. Given these three choices, self-medication is often viewed as the best alternative; thus, the person returns to alcohol and drug use.

THE LAPSE—RESUMPTION OF ALCOHOL AND DRUG USE

Once patients resume alcohol or drug use, they are in a serious emergency. Some patients resume use with the full knowledge of the predictable outcome and intend to lose control. Others attempt controlled use, consuming just enough alcohol or drugs to manage the symptoms. As mentioned earlier, fewer than 2 percent of all patients who attempt moderate controlled use of moderate quantities succeed. The others either return to sobriety or lose control (Pickens et al. 1985).

The start of alcohol and drug use creates an abstinence violation effect or judgment of self as a failure because abstinence has been violated (Marlatt and Gordon 1985). This self-indictment, which is accompanied by the emotions of shame and guilt, lowers the belief of these alcoholics that they can take action to interrupt the relapse. The shame and guilt increase personal pain; thus, the compulsion to continue alcohol use in order to relieve pain increases. The end result can be a loss of control that leads to a progressive pattern of relapse.

IMPLICATIONS FOR TREATMENT

This discussion suggests several approaches to the clinical management of the relapse-prone patient:

1. It suggests that relapse is a natural part of the recovery process. There is nothing morally wrong with an alcoholic experiencing a relapse, just as there is nothing morally wrong with a heart disease patient having a second or third heart attack. This recognition dictates use of a nonjudgmental, supportive approach to the relapse-prone patient. It implies the elimination of punitive policies and procedures that limit treatment options for the motivated relapse-prone patient.
2. This model places strong emphasis on the need to engage the patient in long-term followup and treatment. Loosely structured aftercare programs have not proved to be sufficient in preventing relapse. Ongoing outpatient interventions are required. They should be designed to address specific needs of each recovery period and to intervene when patients experience "stuck points" or relapse warning signs.
3. This model suggests that there are lifestyle risk factors associated with relapse in alcoholism just as there are with heart and other diseases. Risk-factor reduction can increase resistance to sobriety-based dysfunction and can lower relapse rates.
4. By identifying internal warning signs that precede relapse, it is possible to teach patients to recognize and manage these symptoms before external dysfunction results.

5. Since observable, external warning signs typically occur before addictive use, it is possible to use intervention techniques that involve family members, self-help group members, coworkers, and supervisors. These intervention strategies can interrupt the progression of the relapse before addictive use occurs.
6. Recognizing the existence of an abstinence violation effect that influences either loss of control or return to treatment allows us to instruct patients on how to respond to an initial lapse. Thus, we can increase the likelihood that they will return to abstinence rather than progress to a destructive relapse.
7. The knowledge that loss of control is progressive allows planning with the patient on how to interrupt a relapse before serious biopsychosocial consequences result. An early intervention plan can be developed by the patient and significant others before addictive use begins. This plan can be implemented by significant others at the first sign of alcohol and drug use.

ANTICIPATED OUTCOMES WITH RELAPSE PREVENTION PLANNING

My clinical experience indicates that relapse prevention planning will reduce the frequency, duration, and severity of relapse episodes. Because the natural history of recovery appears to dictate that 60 to 80 percent of all patients will be unable to maintain abstinence after the first treatment episode, treatment centers need to offer relapse prevention as a standard part of treatment center services (Brown 1985).

AVAILABILITY OF RELAPSE PREVENTION TECHNOLOGY

Relapse prevention technology is readily available to any treatment program that decides to implement it. Three strategies assist in its implementation in inpatient settings. The first is the development of a special relapse-prevention treatment plan for each patient in treatment. The second strategy is the addition of relapse prevention as a special interest group in the therapy schedule for relapse-prone patients. The third, and most effective, is the implementation of a special relapse-prevention treatment track that includes relapse education, relapse-prevention group therapy, and relapse-prevention self-help groups.

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LONG-TERM WITHDRAWAL

A COMPLICATING FACTOR IN RECOVERY

It is well known that alcohol is a mood-altering drug that produces its primary effects upon the central nervous system (CNS). These effects are obvious during periods of intoxication and acute withdrawal. In the past, the physical effects of alcoholism were thought to be in remission within 3 to 10 days after the cessation of alcohol and drug use. Patients' complaints about difficulties with thinking, emotions, memory, and behavioral control after the first 10 days of abstinence were assumed to be psychological in origin.

Research into the long-term aftereffects of alcoholism are forcing reconsideration of this view. Long-term CNS effects from alcoholism appear to persist for months or even years into the recovery period (Grant et al. 1984). These effects result from a protracted subacute withdrawal syndrome combined with long-term neuropsychological impairments (Begleiter 1981). These two long-term sets of symptoms are often referred to as *postacute withdrawal syndrome* (PAW).

PAW has six primary clusters of symptoms (Gorski 1986). The first involves a thought disorder marked by mind racing, the inability to complete logical conceptual thought, and periods of confusion. The second cluster includes an affective disorder marked by periods of emotional overreaction followed by periods of emotional numbness. The third consists of short-term and long-term memory problems; the fourth, of psychomotor coordination problems that result in accident proneness. The fifth cluster encompasses sleep impairments. The sixth involves a stress-management disorder marked by an inability to recognize low levels of stress and the tendency to experience severe PAW symptoms whenever high stress levels are present.

The severity of PAW symptoms varies from patient to patient and is influenced by genetic susceptibility, stage of addiction, age, frequency and quantity of recent alcohol and drug use, and related head trauma.

The clusters of PAW appear to manifest themselves in four general patterns: regenerative, degenerative, stable, and intermittent. In the regenerative pattern, patients tend to recover from PAW over a period of 2 to 3 months and show low levels of recurring symptoms. These patients are often early-stage alcoholics or abusers with limited histories of familial alcoholism and probability of related genetic impairment. They also tend to have good skills for coping with stress and life problems.

In the degenerative pattern, PAW actually gets worse as the length of abstinence increases. These patients tend to be chronic-stage alcoholics experiencing strong evidence of physical dependence and high risk of a genetic factor in familial alcoholism. They also tend to have rigid personalities and limited coping skills.

In the stable pattern of PAW, the symptoms persist at the same level with very little improvement over time. The symptoms of these patients do not improve regardless of the efforts invested in their treatment program. The result often is extreme frustration when the patient observes others making progress.

The intermittent pattern of PAW is the most common. As patients maintain abstinence, the symptoms gradually begin to improve over a period of 30 to 180 days. Patients then begin to experience periods of time when they are symptom free; however, periodically, PAW symptoms do return. Over a period of time the PAW episodes occur less frequently and are shorter and less severe. After 2 to 3 years, the symptoms may be in remission for long periods of time.

Episodes of PAW can be caused by internal or external events that induce acute stress or by the gradual buildup of chronic stress. The symptoms of PAW do not respond to traditional psychotherapy, and harsh confrontation methods actually make the syndrome worse. The primary intervention involves assessment and education about the PAW symptoms. Most patients are not aware that PAW has its basis in CNS damage and is aggravated by psychosocial stress. The majority of these patients who experience PAW believe they are going crazy or are not involved in an effective recovery program. They experience shame and guilt, and they attempt to hide and deny the symptoms.

Once patients are aware that PAW persists for long periods, they can be taught to identify the type and severity of symptoms. The patient can then learn specific techniques

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The Mystery of Craving

ARNOLD M. LUDWIG, M.D.

Among the fundamental questions that need to be answered about recovery from alcoholism are: Why do otherwise intelligent men and women find it so difficult to resist the temptation to drink? And once they surrender to their craving, why are they unable to stop consuming alcohol before reaching the state of intoxication or stupor? Finally, what is this seemingly irresistible urge that can eventually give way to an unquenchable thirst even in individuals who have managed for years to achieve and maintain an apparently stable recovery?

Although thinking I knew everything about craving for alcohol as a result of my prior studies, I accidentally stumbled upon a puzzling, but remarkable, feature of this phenomenon about 5 years ago through an experience with another addictive substance, nicotine. I realized that this feature of craving—its sometimes mysterious appearance and disappearance—is still little understood, even though it plays an essential role in both relapse and successful recovery from alcoholism.

NICOTINE CRAVING— A PERSONAL OBSERVATION

For more than 25 years, I had been an inveterate smoker, first of cigarettes, then a pipe. In the latter years, every occasion, no matter how minor, served as an excuse for me to fill, tamp down, and then light up another bowl of tobacco. I would seek out the distinctive taste of tobacco smoke, nursed lovingly for a long moment in my mouth after each precious inhalation and regretful exhalation. I smoked even though my hard palate was raw by the end of each evening; ulcerations were obvious on my tongue; my teeth were tobacco-stained; I had a chronic sinus condition and cough; and I realized the likelihood that I would develop cancer of the tongue, throat, or lungs. Every night I vowed to stop this insane habit. Every morning I succumbed to my intense craving for tobacco.

In February 1980, I decided to stop smoking for a few days because of a bad sore throat. When the condition improved, I vowed to stop smoking permanently. Although I had tried to quit before, I knew with certainty that this time I would be successful. The craving for tobacco was gone. I never again experienced any conscious desire to smoke.

The question is: What happened to the craving? No scientific explanation seemed adequate to account for the sudden disappearance of this almost incessant, obsessive urge that dominated my daily life for so many years. The disapperance bordered on the miraculous. How could so overpowering an urge vanish so completely? Was it lying dormant, waiting to be reawakened by my first puff of smoke, or was it gone forever? I sensed it was still lurking within some deep recess of my mind, but I did not want to find out by smoking another cigarette.

My experience contrasted with that of my wife, who quit smoking 1 month later. For the first year or two, she struggled to resist the desire to smoke; craving was with her constantly, even during sleep. By the third year, she still had powerful urges to smoke, particularly in the evening, but the general frequency and intensity of the desire mercifully began to abate and then, finally, to disappear.

These anecdotal accounts are not so different, as we shall see, from those described by many recovering alcoholics. After years of dependence, some people report that their craving vanished suddenly. For others, it lingered on to torment them for years, even intruding into dreams. The insights I gained as my wife and I recovered from our addictions to nicotine led me to new and productive research on the role of craving in recovery from alcoholism.

My new research (Ludwig, in press) and that of other investigators provide insights that can help alcoholics better understand and deal with their cravings. When recovering alcoholics can gain an understanding of the forces that influence them to think or behave as they do, the potential for control is enhanced. As the mystery of craving is solved, forces that previously seemed inexplicable now become subject to conscious examination and voluntary control. This is an important first step in recovery.

This article summarizes what is known about craving and discusses new findings that provide clues about its origin and its role in recovery from alcoholism.

WHAT IS CRAVING?

It is particularly intriguing that so powerful and overpowering an urge as craving should be the subject of scientific controversy, not only about its nature but also about its very existence. Behaviorally oriented scientists tend to disregard the importance of craving because it usually is defined as subsequent drinking behavior (Mello 1972). For these scientists, craving is presumed to be equivalent to uncontrolled drinking. They focus on actual drinking behavior, not on what someone experiences or thinks. Proponents of this viewpoint deny the importance of craving as a motivating factor in drinking. They credit environmental reinforcers as the

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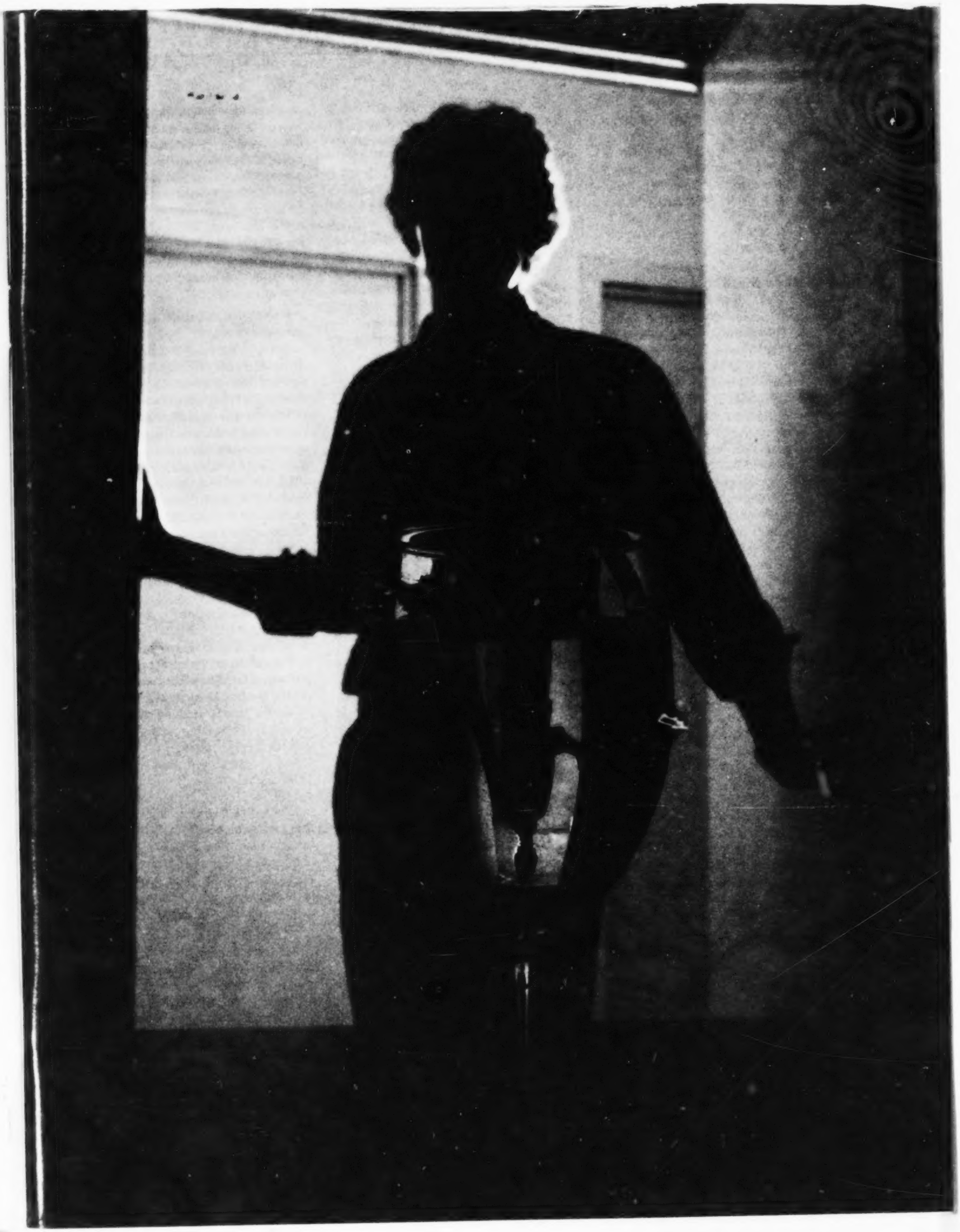

alcohol (Ludwig 1975). Certain drugs like sedatives (e.g., barbiturates) or minor tranquilizers (e.g., Librium, Valium), which have beeen used to treat anxiety in alcoholics, may actually serve to keep the embers of craving alive, continually reminding the person of how it feels to be mildly intoxicated. As a consequence, many alcoholics seeking abstinence merely trade a dependency on alcohol for a dependency on these drugs. They have rid themselves of alcohol but not alcohol-like drugs.

LESSONS FROM RESEARCH ON NARCOTIC DRUG ADDICTIONS

Some understanding about the nature of alcohol craving, in my opinion, can be gleaned from what already is known about related disorders. Although much is unique about alcoholism, the obsessive nature of craving is similar to that observed as "narcotic hunger" in opiate addiction, excessive appetite in obesity, and nicotine craving in heavy cigarette use. Alcoholism also has much in common with the relatively uncontrollable urges in other forms of addictions, compulsions, or impulsive disorders, such as stimulant or sedative drug dependence and even kleptomania and gambling. However, the most fruitful insights into craving in alcoholics come from the results of investigations on narcotic drug use. That is where most of the pioneering work on "addiction" has been done.

Dr. Abraham Wikler, psychiatrist and neurologist at the Addiction Research Center of the U.S. Public Health Service Hospital in Lexington, KY, was puzzled by the frequent reports of many treated heroin addicts who left the hospital feeling confident and hopeful but suddenly became sick on the train back to New York or in their home neighborhoods. Usually, they regarded their "sickness" as the "flu," but the symptoms they experienced — aching all over, runny nose, muscle aches and pains, watery eyes, sweatiness — were strongly suggestive of early opiate withdrawal phenomena and usually led to resumption of drug use. These observations and Wikler's later research (1973) supported the suspicion that these symptoms of "sickness," which commonly plagued ex-addicts who were trying to stay straight, were really conditioned responses to certain environmental cues associated with past drug use.

There is strong supporting evidence for Wikler's findings. Rats previously addicted to opiates in certain cages repeatedly show signs of drug withdrawal when returned to these cages. A number of studies also have demonstrated that narcotic addicts can be induced to experience conditioned withdrawal symptoms, such as a runny nose, tearing, and aching all over, when exposed to pictures of common drug paraphernalia or drug use (O'Brien et al. 1975; Ternes et al. 1979).

These conditioned responses explain other features of drug use as well. Distress and tension caused by opiate withdrawal, together with their subsequent relief by a narcotic, may establish a habit of using drugs to relieve any distress and tension based on psychological causes. The addict somehow assumes, either consciously or unconsciously, that if a narcotic will relieve the discomfort associated with drug withdrawal, it will relieve all forms of discomfort.

CONDITIONED RESPONSES IN ALCOHOLICS

Applying a similar thesis to alcoholism, we should expect that craving and other withdrawal phenomena will become conditioned through prior experiences of alcohol withdrawal or times when alcohol intake has been drastically reduced. There is evidence to suggest that the more frequent and severe the past withdrawal experiences, the greater inclination toward conditioned alcohol withdrawal accompanied by an associated craving for a drink (Hodgson et al. 1979; Kaplan et al. 1983). In other words, the more times that uncomfortable withdrawal symptoms — shakiness, agitation, hallucinations, or confusion — have been relieved by drinking in the past, the greater the likelihood that familiar drinking cues will later be able to stimulate craving in alcoholics.

In one recent study (Eriksen and Goetestam 1984) designed to test the extent to which alcohol withdrawal symptoms could be conditioned to various drinking cues, 16 abstinent alcoholics were exposed on separate occasions to two sets of slides, one showing alcohol-related scenes (liquor bottles, drinks) and the other, scenes unrelated to alcohol. The results showed that in comparison with scenes in the non-alcohol-related slides, the alcohol-related scenes produced more significant increases in craving, as well as tension and anxiety. This outcome supports earlier findings that the craving response of alcoholics is heightened in environments conducive to drinking.

Through conditioning, alcohol-related cues can induce an unpleasant emotional state prompting an alcoholic to seek relief by taking a drink; but they also can trigger pleasant expectations, such as salivation, giddiness, and an imagined inner warmth, in anticipation of the relaxing or euphoric effects of alcohol. Craving for alcohol, then, can appear not only during times when alcoholics are seeking relief from distress, but also when they are anticipating pleasure through drinking (Donovan and Chaney 1985; Ludwig 1982).

FUNCTION OF CRAVING

From what has already been said, it appears that the subjective experience of craving represents an effective way to ward off sensed danger, threat, or physiological distress by alerting the alcoholic to a potential source of relief, namely, alcohol. It also may serve as a directional sign toward pleasure. The individual does not have to ask, "What can I do for fun or relaxation?" Mentally picturing the drink and almost tasting it offers a clear course of action. No trial and error activity is necessary. Were it not for this automatic identification of alcohol as the relief for amorphous and ambiguous feelings, the behavior of alcoholics would be far less goal directed and far more disorganized, fragmented, and haphazard. One alcoholic summarized this phenomenon well. He observed that some mornings when he awakened and did not "feel right," he knew that he needed something. What he needed could have been breakfast or an antihistamine, but he usually concluded that it was alcohol. More times than not, a drink temporarily quelled his unease.

It should be made clear that alcohol-related cues are not all external (e.g., liquor bottles, commercials). Most of them, in fact, arise within the individual and are associated with certain feeling states. Although craving can arise in response to pleasant states, it more commonly accompanies unpleasant ones. Members of AA use the term, *H.A.L.T.* — an acronym standing for *h*unger, *a*nger, *l*oneliness, and *t*iredness — to reflect their belief that these conditions make alcoholics more vulnerable to relapse. Research supports this view. In one sample of alcoholics, for example, between 75 percent and 93 percent claimed to experience craving when they were bored, sad, worried, nervous, or depressed, compared with the 5 to 35 percent who reported craving when they were busy, relaxed, or happy (Ludwig and Stark 1974). In another sample, 85 percent reported craving in the former situation, and 58 percent had this sensation in the latter (Mathew et al. 1979).

INDIVIDUAL "BELLS" OR ALCOHOL-CONDITIONING PATTERNS

Many of the cues that elicit craving tend to be highly specific to the individual. For instance, Bob Welch, the pitcher for the Los Angeles Dodgers, experienced a great need to drink during an airplane flight, after a game of golf, or after pitching (Wholey 1984). Other individuals report conditioned responses to equally unique situations. The results of my most recent studies strongly support these observations (Ludwig, in press). In an attempt to identify more precisely the conditions under which craving was most likely to appear, I asked 150 abstinent alcoholics who had achieved varying degrees of sobriety for detailed information about any automatic, reflex-type craving responses they had in response to certain types of stimuli or situations. Just as Pavlov's dogs were conditioned to salivate in response to the sound of a bell that previously had preceded the appearance of food, I sought to identify any "bells" that initiated craving in alcoholic test subjects. About 93 percent of the sample could identify one or more "bells" as triggers for craving. As is shown in Table 1, the range and types of responses were revealing. With the exception of "internal tension," which was mentioned by more than 50 percent of these particular alcoholics, the wide range of other reported drinking bells indicates that individual differences often have to be taken into account in our understanding of craving. While almost all alcoholics respond to specific bells, what may be a temptation for some does not necessarily trigger a response in others.

Table 1 **Alcoholics' Responses to Stimuli**

Situation	Cues	Percent of Sample
Social interaction	Cocktail parties Dances	36
Mealtime	Wine with dinner Wine list	5
End of the work day	Put in a hard day's work It's time to relax Usual drinking time	6
Depression	Feeling lonely Sorry for oneself Discouraged	11
Hot weather activities	Mowing yard Fishing Barbecue	6
Celebrations	Winning at races Having a good day	3
Music	Songs with memories Music in bars	7
Romance	Alone with wife and a bottle of wine	5
Bars	Old drinking places Barroom atmosphere	3
Alcohol ads	Commercials, ice cold drinks on poster	5
Miscellaneous situations	Flying on airplanes Sports events Sailing Driving over roads where used to drink Pain Insomnia Rock concerts Bottle in gutter Free time Talking about alcohol Drinking	21

Other findings have to be tempered by awareness that the number of bells capable of evoking craving can expand or shrink, depending upon whether individuals are drinking. When individuals are drinking heavily and steadily, almost every situation or circumstance may become an excuse for drinking (Cahalan et al. 1969). They reach a point where they drink because they drink. When individuals have not been drinking for some time, the range of bells that trigger craving tends to narrow, and each becomes more specific. For sober alcoholics, the same bells that once clanged in their heads when drinking can be silenced or become muffled tinkles, capable of being easily ignored.

These findings from research on craving are of more than theoretical interest. Although many alcoholics feel helpless and bewildered when—seemingly out of the blue—craving strikes, it is not the quixotic, elusive, mysterious force that many believe it to be. On the contrary, it is a natural phenomenon, like thirst or hunger, and subject to the same natural laws. To a large extent, its appearance is predictable, once certain information is known about an individual. Even though individuals may not be aware of just what is happening, there usually are internal or external cues that trigger this urge, particularly when individuals are in a predisposed, vulnerable state of mind. The individual may not be aware of just what is happening. Under the proper conditions, craving may arise like a phoenix in alcoholics who have been sober for years; or it can disappear entirely in their drinking brethren who find themselves in places—like jails, hospitals, or laboratory settings—where there are strong prohibitions against drinking. When reinforced by periodic or continued drinking, craving tends to remain at full strength. When not reinforced, as during an extended period of sobriety, it tends to weaken over time. It also is apparent that when craving arises, it serves to direct alcoholics to a potential

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Lifestyle Rehabilitation

The Second Recovery Track

FRED ZACKON, M. ED.

In treating people for alcohol and drug dependence, as in so many of life's tasks, we often define the object of our attention through the tools with which we work. That is to say, just as the carpenter comes to know wood by using the chisel and plane, so, too, does the clinician tend to see recoveries in terms of the therapies employed. When the work goes well, that is fine. But when, despite our best efforts and real progress, the project stalls or even collapses upon itself, then it's time to ask afresh, What does this work require, and how best can we use our tools? With this notion in mind, I share the following thoughts about treatment of and recovery from alcohol and drug dependence.

If the bad news is that there are more dependent people, the good news is that more people are in recovery. And this latter population, progressing at varying rates by various routes, affords us ever better perspectives on what sustained abstinence requires. Alcoholics and addicts who succeed in constructing solid, satisfying, drug-free lifestyles can usually describe a course of personal growth that, as I see it, has progressed along two major tracks. I call these the *primary* and *secondary* tracks of recovery, and I suggest that, by clearly distinguishing between them, treatment providers can find major new opportunities and important new tools.

What is recovery's primary track? It is the acquisition of psychological insight and healthy values together with the generation of a positive self-concept. These accomplishments find expression in a rock-hard commitment to abstinence and further growth. Usually beginning only after the storms of withdrawal, primary recovery requires, at a minimum, a painful retrospection and an informed self-acknowledgment of one's dependency. Primary recovery is often inseparably linked with spiritual development and is inspired by the commitment and support of peers. It may be facilitated by psychotherapy, education about alcoholism and drug dependence, family counseling, and so on.

This article was adapted from the author's "Retooling Our Technology for Recovery," which appeared in the November 1985 issue of U.S. Journal.

Initiating primary recovery constitutes the heart and soul of most treatment. Continuing this work is the central task of Alcoholics Anonymous (AA) and Narcotics Anonymous (NA). I say "continuing" because the psychospiritual understructure of abstinence needs unending devotion and awareness. The track of primary recovery, then, is the route of inner change. Therapy, education, and the Twelve Steps programs are among the tools so widely and well employed in that work.

So profound and challenging is the process of inner change that it is easy to misperceive other vital components of recovery as inevitable outgrowths of that change, or even to miss seeing them entirely. For people whose abstinence is most secure and satisfying, however, lifestyle rehabilitation parallels the growth of insight and commitment. It is the rehabilitation that I call secondary recovery. Although it cannot begin effectively until major attitude changes are well under way, it is not a natural consequence of those changes.

Consider some key tasks of secondary recovery:

"De-addiction." For many alcohol- and drug-dependent persons—especially for opiate and cocaine addicts—the urge to get high is often an automatic response to environmental or internal triggers, such as particular neighborhoods, chance encounters with active users, transient thoughts, or maybe certain smells, weather conditions, and more. A strong commitment to abstinence does not, by itself, teach people what their unique craving triggers are or guide them toward reducing the impact—which, if not reduced, can eventually overpower the commitment. Reducing the power of conditioned craving is what I call "de-addiction," a learning process that one accomplishes either by good luck, or, more quickly and much more safely, as a result of thoughtful guidance and deliberate action.

Learning New Pleasures. Few pleasures come easily. Whether it's participating in a sport or simply watching it; be it reading, gardening, playing cards, or even eating good food, a given recreation choice takes time and effort to become part of a lifestyle. Usually it takes social support to develop skills and acquire the "taste." Otherwise, a new activity can be alien and intimidating, or it can turn bland as its novelty wears off. For people whose virtually sole satisfaction has been chemically induced euphoria, finding and adapting to new pleasure-giving activities is sometimes hit and too often miss. More than encouragement, what is needed is steady, sensitive assistance.

Social Integration. While AA and NA meetings provide a vehicle for socialization,

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For people whose abstinence is most secure and satisfying . . . lifestyle rehabilitation parallels the growth of insight and commitment.

Alexander Tucker

Problems in Predicting Recovery from Alcoholism

DAN J. LETTIERI, PH.D.

Although the need for useful predictors of alcoholism treatment program outcomes is obvious, research in this field has not adequately succeeded in isolating factors that will assess prospects for success. The failure to develop these predictive tools has been based in large part on subtle methodological issues and also, in part, on an overly simplistic conception of alcohol dependency. Five salient issues impede needed advances: (1) unidimensionality in our view of alcohol-dependent persons, (2) a lack of standard measurement instruments and the use of heterogeneous sample groups, (3) the "developmental lag" related to the cyclic nature of the disease, (4) the need for multistage prediction, and (5) our inability to assess treatment readiness. To begin a discussion on treatment, it may be useful to delineate its components. Treatment, as the term is generally used, comprises four basic components: content, format, setting, and process.

Content refers to the specific treatment regimens, protocols, and procedures. *Format* refers to the style and form of treatment, (e.g., individual, group, family, educational, brief intervention). *Setting* refers to the locale and environment (e.g., inpatient, outpatient, free-standing, shelter, etc.). *Therapeutic process* refers to a specialized human relationship that a skilled therapist develops, maintains, and manages with therapeutic intent. The goal is the promotion of learning within an interpersonal context.

PROBLEMS RESULTING FROM A UNIDIMENSIONAL VIEW OF ALCOHOL DEPENDENCE

One can no longer assume that there is unidimensionality in alcoholics' personalities—or, if you prefer, a universal alcoholic type. While it is convenient to lump such ailing individuals into one classification scheme, research and clinical practice pay a high penalty for such unfortunate generalities. What is worse, a client may pay the highest price—namely, ineffective treatment or mismatched treatment with an increased likelihood of treatment recidivism.

It seems clear, clinically, that there are many different types of alcohol-dependent persons, just as there are many types of treatment regimens and treatment settings. The delineation and mapping of the complex interaction among setting, treatment regimen, and personal characteristics must be our principal task in this decade. In addition, cost containment demands that we move in this direction if reasonable, cost-effective alcoholism treatment is to remain a viable part of our therapeutic endeavors.

At present, alcoholism can best be viewed as a multidimensional rather than a unidimensional disorder; thus, the degree of alcohol dependency is probably best measured multidimensionally. Alcohol dependence and problem drinking are neither unitary phenomena nor unidimensional syndromes; rather, there appear to be qualitatively and quantitatively different types of alcohol-dependent persons. Skinner and Allen (1982) describe three axes that conceptualize alcohol dependency. The three axes are (1) alcohol consumption level, (2) severity of dependence, and (3) medical and psychosocial problems. This is an excellent beginning to improvement of measurement techniques, but additional axes probably will be needed.

LACK OF STANDARD MEASUREMENT INSTRUMENT AND HETEROGENEITY OF THE SAMPLE GROUP

The nonstandardization of the diagnosis and definition of the "alcoholic" person has resulted in heterogeneous groups of persons being defined and counted as "alcoholic." This problem is based largely on the lack of a widely accepted diagnostic instrument. To illustrate the problem: Some young, male, frequent-heavy drinkers appear to mature out of their involvement with alcohol, while others continue on to chronic drinking problems. Some researchers have suggested that there may be two worlds of alcoholism: one that consists of alcohol-abusing persons (who may be frequent-heavy drinkers but not dependent on alcohol) and the other of alcohol-dependent persons.

Although criteria for diagnosing alcoholism have not been firmly established, measures are available and are used in the field. A newly published monograph by the National Institute on Alcohol Abuse and Alcoholism (NIAAA 1985) presents 45 of these instruments. One possible resolution to the measurement problem is to select three or more instruments and, for *research* purposes, to require that a client score as an "alcoholic" on at least two of the three scales. Benefits of this procedure would be to minimize the heterogeneity of the client sample groups and permit cross-study comparisons.

This issue of heterogeneous groups has detrimentally mollified researchers' abilities to systematically detect and/or assess treatment efficacy in at least two ways: (1) by the conceptual inexactitude of mixing various types of alcohol-abusing persons into a single "alcoholic" category and (2) by

Research and clinical practice pay a high penalty for assuming the existence of a universal alcoholic personality

Kurt Mulholland

the statistical regression to the mean of outcome measures and the masking of positive therapeutic changes that might have occurred for some persons in the sample group as a result of treatment. This regression occurs as follows: If a sample group is heterogeneous, average treatment efficacy across the heterogeneous group causes the treatment success scores to regress toward the mean. Thus, overall success rates are lowered. The statistical "noise" prevalent in a heterogeneous group statistically minimizes detection of distinct improvements in some persons of the group as compared with others.

One of the dilemmas in conducting research on alcoholism treatment is the impracticability of conducting studies utilizing random assignment to treatment. Random assignment is a pseudoproblem, however, not a requirement for scientific merit. Randomization merely is a nice way to compensate for heterogeneous sample groups. Other compensatory options are matching, covariance, and use of composite indices. A recently published volume by Trochim (1984) offers another alternative to randomized studies: namely, use of the regression-discontinuity design in which subjects need not be randomized.

Some researchers (e.g., Blane 1984) have cogently argued for at least the following classes of alcohol using or abusing persons:

- Alcohol dependent
- Alcohol abuser
- Nondependent and nonabusing frequent-heavy drinker
- Social drinker

Acceptance and use of such a classification scheme would greatly improve our ability to conduct research with scientific merit that will help in development of measures with predictive validity.

Figure 1 **The Developmental Lag Problem—Course of Alcohol Dependency Over Time For One Person**

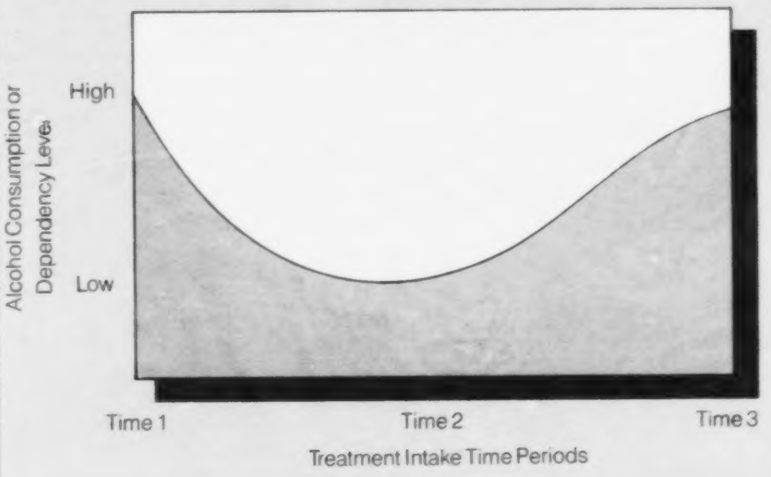
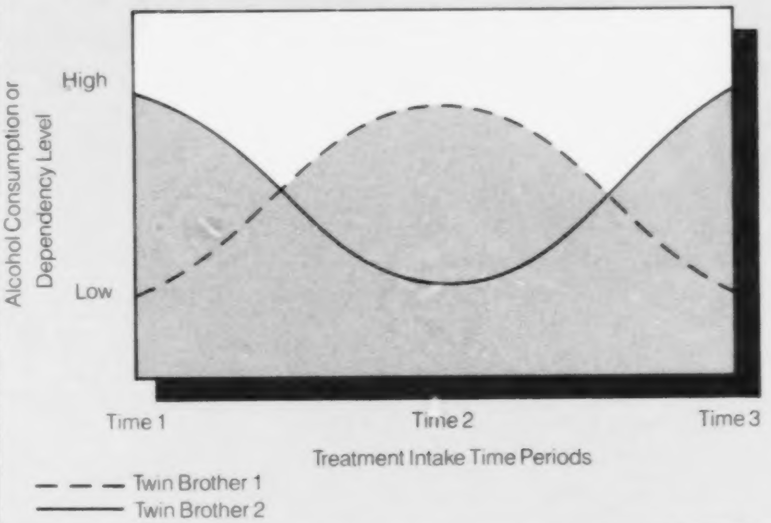


Figure 2 **The Developmental Lag Problem—Course of Alcohol Dependency Over Time For Two Similar Cases**



THE DEVELOPMENTAL LAG PROBLEM: WHEN TO TAKE MEASUREMENTS

Because the course of alcoholism waxes and wanes, much like a bimodal or multimodal curve with peaks and valleys (Figure 1), the problem of measurement is complicated. One must be able to assess at what point in the client's ailment the client has come for aid. If clients are assessed at intake while at a peak in drinking, some spontaneous or unaided recovery (that is, some lessening of the drinking) may occur simply because people fluctuate in their drinking behaviors over time. Thus, a subtle, but insidious, analytical problem arises in interpreting what portion of treatment effects is based on the treatment per se and what portion is attributable to the natural course of the ailment—namely, the client's natural movement toward new peaks or valleys in behavior.

Figure 1 points out that for valid measurement of treatment effects, we must know something about where a presenting client is in the cyclic peaks and valleys of the ailment. Because the assessment of treatment efficacy will be affected by the timing of the intake and followup measures, we need to know the client's cycle. If we make an initial assessment at a peak (high consumption) and follow up at a time when the client is in a valley (low consumption period), then treatment will look very efficacious. If followup is done at a peak, then efficacy will not look as good.

The problem is further compounded when these effects are considered across a number of clients. For example, let us assume we have identical twin brothers with identical alcohol problems (see Figure 2). For statistical purposes, everything about them is the same except that brother number 1 is measured at a peak in his drinking and brother number 2 is measured in a valley. In short, the waxings and wanings of their

Table 1 **A Generic Four-Stage Screening, Assessment Process**

Stage 1 **Client is assessed for type of alcohol use or abuse problem.**

1. Alcohol dependent (chronic)
2. Alcohol abuser (problem drinker)
3. Nondependent and nonabusing frequent-heavy drinker
4. Social drinker

Stage 2 **Client is assessed for severity of other related problems.**

These can be viewed as potential contraindications for successful treatment outcomes.

1. Other drug dependency (e.g., multiple drug use)
2. Psychological health (e.g., sociopathy, psychosis, affective disorders)
3. Physical health (e.g., physical, neurological impairments)

Stage 3 **Client is assessed for treatment readiness.**

Aim is to assess (a) client's motivation to change drinking behavior; (b) client's suitability for certain types of treatment; (c) presence of external motivators to enhance change; and (d) the client's overall treatment readiness, entailing assessments of psychological, physical, fiscal, and social factors (including interpersonal resources, significant others, etc.).

Stage 4 **Staff confers and selects the most clinically appropriate and cost-effective treatments.**

This stage would entail utilizing a scale unique for each of several classes of alcohol-using or abusing persons to permit selection of the best fit of client, setting, and treatment regimen. Separate prediction tools should be devised for some or most of the following therapeutic regimens and for most of the various classes of alcohol-using/abusing persons:

1. Psychotherapy and insight-oriented therapies
2. Pharmacotherapy
3. Controlled-environment approaches and behavioral-cognitive restructuring therapies
4. Social-support therapies (peer, family, group, etc.)
5. Educational and informational approaches and values clarification

Table 2 **Treatment Philosophies: Four Models of Helping and Coping**

Medical Model	People are responsible for neither problems nor solutions.
Moral Model	People *are* responsible for problems and solutions.
Compensatory Model	People are not responsible for *problems* but *are* responsible for *solutions.*
Enlightenment Model	People are not responsible for *solutions* but *are* responsible for *problems.*

Adapted from Brickman et al. 1982

ailments are not synchronous. In Figure 2, the dotted curve is for brother number 1 and the solid curve is for brother number 2. Both enter treatment on the same day. At the point of an intake interview, one brother is at a peak, the other brother is in a valley. If we give them treatment and then measure them several months later, we will reach very different conclusions about the respective efficacies of their treatments. We will have obscured individual differences in improvements by not taking account of *when* the initial and followup measures were taken.

THE NEED FOR MULTISTAGE PREDICTION

Clinical experience suggests that not everyone is equally ready for treatment at any one particular point in time. It seems important to develop empirical prediction scales for the express goal of assisting in the discernment and screening of which clients may be most suited for what treatment at which point in their alcohol dependency career cycle. It is not implausible to assert that any treatment may be unsuccessful for someone who is not fully "treatment ready."

One needs to assess carefully the various aspects of the client, not the least of which is the client's treatment readiness. One approach to improving the matching of client to treatment would be the use of a multistage screening assessment procedure. In theory, we could have one scale for the young male alcoholic, another for the older female alcoholic, and so on. A general four-stage process such as is shown in Table 1 can be useful for this purpose.

TREATMENT READINESS

Although socioenvironmental and extra-treatment factors do play roles in treatment outcome, treatment readiness also is important. It seems conceptually appropriate to talk about a patient's "treatment readiness" rather than, for example, to focus merely on personal variables or socioenvironmental variables. To recoin an old phrase, we can bring a client to treatment, but we cannot force the client to drink from the therapeutic well.

Consider for a moment our newest venue for treatment research: namely, the notion of matching clients to specific treatment options.

In addition to the use of standard measurements, treatment readiness requires that the essential criterion measures of treatment quality and intensity be considered and measured phenomenologically, by some index of consumer satisfaction. Did the client like the treatment and the setting? The therapist? Did the client feel the treatment helped? It is not fully appropriate to attribute the quality to the therapist or the setting: The client must be a part of the treatment assessment equation.

Treatment readiness also implies the readiness and the receptivity of the care provider to dispensing treatment and the amicability and the receptivity of the setting to enhancing treatment readiness and treatment success. In short, a mandatory next step must be to measure the philosophic underpinnings of the treatment setting and the treatment providers. A most insightful analysis of the various models of coping and helping (see Table 2) has been done by Brickman and his colleagues (1982).

These researchers present four models. These models are akin to descriptions of the philosophic stance taken by the caretaker as well as by the client concerning the client's ailment. For instance, the moral model argues that the responsibility for both the problem and the solution rests with the client. In contrast, the medical model argues that responsibility for neither rests

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Recovery Without Treatment

THOMAS PRUGH

In 1849, the Swedish physician Magnus Huss, inventor of the term "alcoholism," observed that "it is a rare exception to meet with an alcoholic who is over 60 years of age" (cited in Drew 1968, p. 965). Recent population studies have tended to support this contention and have prompted researchers to seek ways to explain why the prevalence and the incidence of alcoholism seem to decline with increasing age. Drew (1968) names three likely candidates:

- *Mortality and chronic morbidity*—Chronic alcoholics die sooner than nonalcoholics, on average, and they also are disproportionately represented in institutional settings and, therefore, are excluded from many surveys that look at alcohol-related problems in the general population.
- *Treatment*—Many alcoholics enter treatment, complete it successfully, and sustain their recovery through their middle and late years.
- *Spontaneous remission or recovery*—An unknown but significant percentage of alcoholics apparently recovers without benefit of formal or institutional treatment, though not necessarily without many of the same kinds of support that treatment methods and programs provide for their clients.

Of these three, spontaneous recovery (SR) is the most narrowly studied and the least well understood. Critics have asserted that it is no more than a "theoretical concept" (L. Dupree, cited in Williams 1984) and that the supporting research mistakes statistical artifacts for the real thing (Cooke 1980). The issue is also clouded by the variability throughout the literature in defining types of drinkers, a fact that sometimes makes it difficult to know the significance of a remission. Tuchfeld (1981) has noted the effort given to developing typologies that include both "addictive" and "nonaddictive" drinkers and that generally assume the capacity for SR in the latter. However, he argues that the growing body of evidence for SR suggests that it occurs in all categories of drinkers.

If the actual incidence and the nature of SR remain unclear, there seems little doubt that SR does exist and that its elucidation might yield valuable insights into the recovery process in general—insights that could be put to use in refining existing treatment methodologies. In particular, further study of spontaneous remissions might indicate "which social circumstances, e.g., changes in marital status, jobs and life conditions, may be most associated with recovery" (Smart 1975/76, p. 277). As will be seen, there appear to be important parallels between the recovery courses of spontaneous remitters and those who succeed in treatment.

The existence of spontaneous recovery among alcohol abusers and alcoholics is supported by a number of studies. Smart (1975/76) argues that since SR has been observed in neurotics, sociopaths, and drug addicts, it should be no surprise that it can be found among alcoholics as well. In this review of the existing literature, Smart notes several studies "suggestive" of a decline in alcoholism rates with age, including a drinking-practices survey (n=1,359) by Calahan and Room that observed high scores on a drinking problems scale in 25 percent of males aged 21 to 29 years, 13 percent of 50- to 59-year-old males, and 1 percent of males aged 70 years or more.

Smart's review also describes studies that specifically looked for evidence of SR, including one by Kendall and Staton, who followed 32 untreated alcoholics for a mean period of 6.7 years after initial contact and found exactly half the subjects to be abstinent or "drinking with social stability." Depending on the criterion, the study "suggests yearly recovery rates of 3.7 to 7.4%" (Smart 1975/76, p. 284). In general, Smart concludes that the studies in his review indicate that SR does occur and that yearly recovery rates vary from 1 percent to 33 percent.

Fillmore and Midanik (1984) compared problem-drinking measurements at two separate times in two groups of male subjects, one aged 21 to 29 years and the second aged 40 to 49 years. They noted untreated remission of alcohol problems in both groups but concluded that the likelihood of SR was substantially higher in the younger cohort, relating this to the "aging out" phenomenon mentioned above. Fillmore and Midanik argue that the key question posed by their research is how to identify those members of the younger group who are likely to wind up, years later, with unremitting alcohol problems.

Studies of the kind cited above have begun to stimulate further work on the qualitative aspects of spontaneous recovery—i.e., "exploratory" research intended to pin down the social and cognitive processes that take place in alcohol abusers and alcoholics who resolve their problems without entering formal treatment. In one such study, Stall (1983) compiled life and drinking histories of 13 self-identified spontaneous remitters. Three general patterns of

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Alexander Locker

ocial support provided by family and friends during remission
s an important theme in one researcher's findings
n successful "spontaneous" recovery.

A Tool for Measuring Body and Behavioral Experiences

Agnes L. Hoffman, Ph.D., C.R.N.
Nada J. Estes, M.S., C.R.N.

Recovery from alcoholism is a long, often difficult process. It is accompanied by varying degrees of anxiety and numerous discomforts that lead to relapse for many individuals; yet the actual body and behavioral experiences of patients in early recovery have not been systematically investigated and documented. To improve treatment outcomes, alcoholics in recovery and their family members need to develop a better understanding of common experiences to allay the anxiety that may accompany onset of symptoms. Being able to recognize and deal with adverse symptoms during the recovery process may help to prevent the resumption of drinking as a means of suppressing symptoms. Treatment providers also need this information to spot fluctuations in severity and frequency of symptoms being experienced by patients. This information can be an important aid for planning interventions at critical points in the recovery process. It also can provide useful baseline data for evaluating treatment outcomes.

The authors developed the Body/Behavioral Experience (BBE) inventory to investigate the nature of experiences in early recovery and tested it to determine its usefulness in describing the occurrence and frequency of symptoms and changes in early recovery from alcoholism. Although still in the development process, the BBE inventory may provide a useful aid for patients and practitioners in the clinical setting.

The Body/Behavioral Experience Inventory

The BBE inventory, shown in Table 1, consists of 48 items grouped into two primary classifications as follows:

- *Body systems*
  - Nervous
  - Cardiovascular
  - Gastrointestinal
- *Behavioral*
  - Perception
  - Cognition
  - Affect
  - Motor.

A total of 17 items relate to the first category, and 31 investigate behavioral effects. Patients are asked to respond to each item, indicating the occurrence of each symptom within the previous 2-week period. Using the BBE inventory data, a profile can be constructed by plotting the frequency of the various symptoms (see Figure 1). Based on the profile, a clinician can identify points for specific interventions. For example, high frequencies of gastrointestinal distress could indicate a need for nutritional information, while recurring symptoms indicating affective problems may suggest a need for counseling in management of anger and depression.

Because accuracy of the profile is based on self-reports, an important consideration is the extent to which a person is sensitive to body and behavioral experiences and able to label and monitor their frequency. Variability also may occur among different patients as a result of such factors as alcohol use history and length of abstinence. Further, when evaluating the results of the inventory, clinicians must be aware that some experiences of early recovery may be found in disease states unrelated to alcoholism; thus, the individual may require further evaluation for diagnosis and treatment.

Research on the BBE Inventory

In developing the inventory, the authors first conducted a test of a preliminary version, which contained a list of body and behavioral experiences identified through a review of the literature (Begleiter and Porjesz 1979; DeSoto et al. 1985; Goluke et al. 1983; Hoffman and Estes 1983, 1984; Kissin 1981; Massman 1979; Thompson and Bowen 1982; Wellman 1954). The instrument then was revised and tested on a sample of 101 alcoholics in recovery.

The Sample

The study sample included 53 men and 48 women in the first 2 years of recovery who met two eligibility criteria: (1) absence of major health problems other than alcoholism and (2) no current use of psychoactive substances. The mean age of the subjects was 39.7 years (SD = 8.48); and mean years of education was 13.78 (SD = 2.22). Fifty-five percent (n = 55) of the subjects were married, 75 percent (n = 74) were employed, and the annual income for the majority was above $21,000 (69 percent, n = 70). The mean length of abstinence, measured in weeks since last alcohol use, was 27.34 (SD = 30.22). Demographically, there were no significant differences between men and women. Men had significantly higher mean years of heavy drinking (M = 13.01, SD = 6.99) than women (M = 10.46, SD = 5.86) ($t = 1.98$, df = 99, $p = .05$).

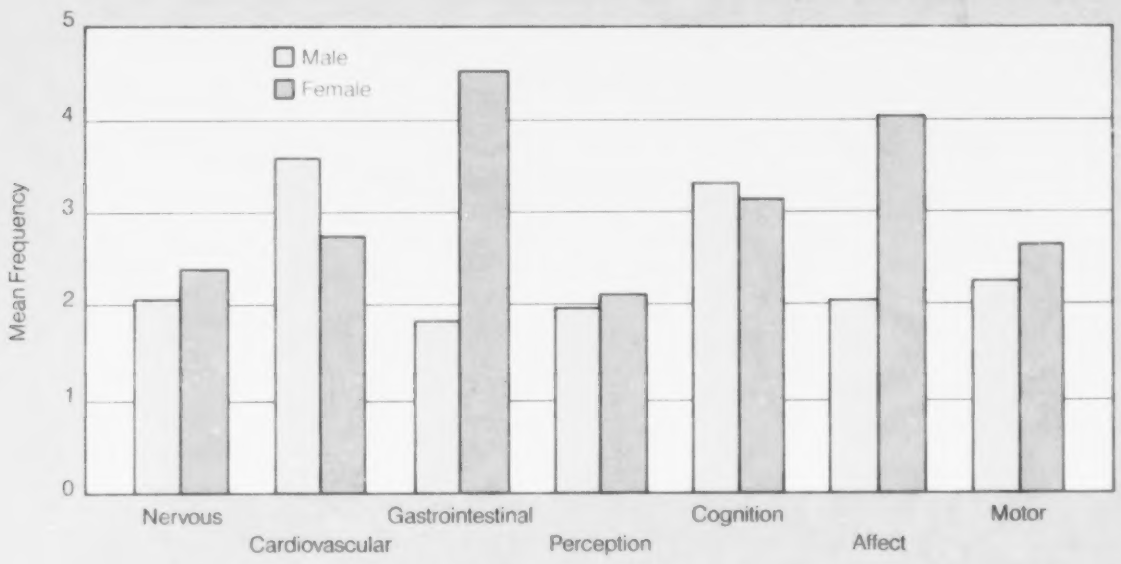
Table 1 **Body/Behavioral Experiences Inventory**

Directions: Below is a list of body and behavioral experiences people sometimes have. Please indicate the number of times you may have had the experience during the past two weeks*.

1. Brief day dreams during normal activities
2. Sleeping more than 8 hours a day
3. Muscle twitching
4. Increased appetite
5. Heightened visual sensations
6. Feelings of sadness
7. Increase in sexual interest
8. Increased ability to engage in sexual activity
9. Heightened sense of sound
10. When entering sleep, severe jerk of the body that results in wakefulness
11. Heart "flutterings" or skipped beat
12. Difficulty concentrating on a subject or activity
13. Brief memory lapses, e.g., inability to recall appointments, meetings, etc.
14. Brief trance-like state during normal daily activities
15. Increased desire for foods containing sugar
16. Food cravings, e.g., citrus fruits, vegetables such as raw potatoes
17. Periods of marked increased energy
18. Super-sensitivity to bright lights, e.g., sunshine, headlights of an oncoming car
19. Severe itching on any area of body
20. Rapid or racing heartbeats
21. Craving for alcohol
22. Fluctuations in weight, e.g., loss and/or gain
23. Increased ability to tolerate physical activities
24. Feeling angry enough to want to break or smash something
25. Heightened brightness of colors in pictures, flowers, etc.
26. Sudden jerk of calf or thigh muscles
27. Working more than 8 hours a day on job-related activities
28. Tremors, shaking
29. Marked mood fluctuations, i.e., episodes of feeling very good followed by periods of depression
30. Lack of or insufficient thought given to purchases made
31. Increased pleasantness of taste sensations
32. Food "binges"
33. Extreme coldness of hands and/or feet
34. Feeling keyed up, jittery, or anxious
35. Periods of increased activity
36. Buying sprees
37. Emotional outbursts
38. Temper tantrums
39. Vivid, horrifying dreams
40. Periods of fatigue during the day
41. Vivid, beautiful dreams
42. Rush of ideas in rapid succession
43. Keen interest in a subject or activity followed by rapid disillusionment
44. Feeling very depressed or melancholic
45. Insomnia
46. Thoughts of suicide
47. Mental confusion
48. Irritability

*Response options to each item:
____ Not at all
____ Less than once a week
____ 1-2 times a week
____ 3-4 times a week
____ 5-7 times a week
____ More than 7 times a week

Figure1 **Sample Body/Behavioral Experiences Profile**



BODY EXPERIENCES

Considerably fewer subjects reported occurrence of body experiences than those reporting behavioral experiences (Tables 2 and 3). However, the range of mean frequencies of experiences reported was greater for body categories than for behavioral.

The occurrence of six body experiences was reported by more than half the sample (see Table 2). The experiences included increased desire for sugar, difficulty concentrating, food binges, increased appetite, weight fluctuations, and jumping at sudden noises. More women than men reported these experiences.

The frequency with which an experience was reported by subjects ranged from less than once a week (scored 1) to more than seven times a week (scored 5). Mean frequency of experiences ranged from 1.43 to 3.00 for subjects reporting occurrence of symptoms (Table 2). Only two experiences had a mean frequency of greater than 2.60 (i.e., approximately 3 or 4 times a week): increased desire for sugar and increased appetite. On both experiences, women reported higher frequencies than men.

BEHAVIORAL EXPERIENCES

The occurrence and frequency of behavioral experiences reported by subjects are summarized in Table 3. More than three-fourths of the sample reported fatigue during the day, irritability, feelings of sadness, feeling "keyed up" or jittery, and marked mood fluctuations. Women reported more frequent occurrences of these symptoms than men. In addition, a greater number of women reported feeling very depressed and experienced craving for alcohol. Increase in sexual interest was reported by a greater percentage of men than women.

Subjects' mean responses on behavioral items ranged from 1.29 to 2.70. Several items resulted in a mean frequency of 2.60 or greater (i.e., approximately 3 or 4 times a week). Behavioral experiences showing a mean of 2.0 or greater included daydreams during daily activities, supersensitivity to bright lights, increase of pleasant taste sensations, heightened sense of sound, and increased tolerance of physical activity.

FINDINGS

The profile of body and behavioral experiences derived from individuals in this cross-section study showed wide ranges in both the occurrence and the frequency of experiences. Women reported significantly fewer years of heavy drinking than men and showed higher rates of occurrence and mean frequencies of body and behavioral experiences on a majority of the items in the inventory. These data suggest that the alcoholism recovery process may involve more problems for women than for men. This finding needs to be addressed in rehabilitation counseling through careful attention to gender differences during recovery.

Mean frequencies of body and behavioral experiences were highest for items related to food intake. The increased desire for sugar, frequency of food binges, and increased appetite may result in excessive carbohydrate ingestion as a replacement for the high caloric content previously obtained from alcoholic beverages. Increased intake of calories may also serve to bolster energy during periods of fatigue, which were reported by 89 percent of the subjects. In addition, food binges during recovery may be a physiologic response to alcohol-induced nutritional deficits. Malnutrition due to malabsorption and inadequte food intake in actively drinking people with alcoholism is common. The ingestion of sugar and/or excessive quantities of food may also provide a substitute for gratifications partially met by alcohol ingestion prior to sobriety. The findings pertaining to food intake support the need for the assessment of nutritional requirements and the implementation of a dietary program tailored to the lifestyle needs of the person in early recovery from alcoholism.

Table 2 **Body Experiences: Percent and Mean Frequency of Occurrence Over a 2-Week Period**

Body Experiences	Occurrence in Percentages			Mean Frequency		
	T(n=101)	M(n=53)	W(n=48)	T(n=101)	M(n=53)	W(n=48)
Increased desire for sugar	71.3	66.0	77.1	3.00	2.63	3.35
Difficulty concentrating	67.3	62.3	72.9	2.46	2.42	2.49
Food binges	61.6	56.6	66.7	2.05	1.80	2.28
Increased appetite	58.4	54.7	62.5	2.78	2.76	2.80
Weight fluctuations	55.4	50.9	60.4	1.89	1.89	1.90
Jumping due to sudden noise	51.5	37.7	66.7	1.88	1.75	1.97
Severe body jerk during sleep	48.5	54.7	41.7	1.98	1.79	2.25
Trancelike state	47.5	49.1	45.8	2.00	1.96	2.05
Food cravings	47.5	45.3	50.1	2.17	2.13	2.21
Vivid, beautiful dreams	43.6	49.1	37.5	1.43	1.35	1.56
Extreme coldness in hands and feet	43.6	30.2	58.3	2.48	2.25	2.61
Heart flutterings	42.6	35.8	50.0	2.16	2.26	2.08
Muscle twitching	42.6	45.3	39.6	2.00	1.92	2.11
Severe itching	38.6	34.0	43.8	2.28	2.00	2.52
Rapid, racing heart beats	36.6	30.2	43.8	2.49	2.31	2.62
Horrifying dreams	36.6	32.1	41.7	1.70	1.53	1.85
Sudden jerk of calf/thigh muscles	31.7	34.0	29.2	1.88	1.72	1.72

NEED FOR ADDITIONAL RESEARCH

The BBE inventory needs additional testing in clinical settings. Although it is still in a developmental stage, further study may demonstrate its potential for investigating a number of unanswered questions about recovery. For example, use of the BBE in a longitudinal study of the occurrence and frequency of body and behavioral experiences could identify common experiences, assess changes in symptoms as recovery progresses, and identify individual reactions to recovery experiences. In a study of this type, the hypothesis that body and behavioral experiences diminish with lengthening alcohol-free recovery could also be tested (Kissin 1981; Massman 1979; Ryan et al. 1980). In addition, the individual experiences of persons in recovery from alcoholism could be differentiated from the experiences of nonalcoholic individuals and of those in recovery from addiction to other mind-altering substances. ■

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Table 3 **Behavioral Experiences: Percent and Mean Frequency of Occurrence Over a 2-Week Period**

Behavioral Experiences	**Occurrence**			**Mean Frequency**		
	T(n = 101)	M(n = 53)	W(n = 48)	T(n = 101)	M(n = 53)	W(n = 48)
Fatigue during day	89.1	86.8	91.7	2.50	2.30	2.70
Irritability	88.1	83.0	93.8	2.22	2.20	2.24
Feelings of sadness	82.2	75.5	89.6	2.53	2.35	2.70
Keyed up or jittery feelings	79.2	71.7	87.5	2.16	2.03	2.29
Marked mood fluctuations	76.2	69.8	83.3	2.27	2.30	2.25
Day dreams during daily activities	72.3	67.9	77.1	2.78	2.58	2.97
Periods of increased activity	72.3	73.6	70.8	2.30	2.36	2.24
Feeling very depressed	72.3	60.4	85.4	2.22	1.94	2.44
Emotional outbursts	71.3	69.8	72.9	1.65	1.51	1.80
Memory lapses	68.3	62.3	75.0	2.00	2.18	1.83
Periods of increased energy	67.3	64.2	70.8	2.51	2.50	2.53
Increase in sexual interest	65.3	73.6	56.3	2.59	2.95	2.07
Rush of ideas in rapid succession	65.3	62.3	68.8	2.20	2.24	2.15
Craving for alcohol	64.4	58.5	70.8	2.46	2.55	2.38
Heightened visual sensation	62.4	51.0	64.6	1.36	1.56	1.17
Sleeping more than 8 hours a day	58.4	58.5	58.3	2.32	2.32	2.32
Insufficient thought for purchases	57.4	54.7	60.4	1.71	1.69	1.72
Mental confusion	56.4	50.9	62.5	1.93	1.70	2.13
Insomnia	53.5	50.9	56.3	2.28	2.11	2.44
Increased tolerance of physical activity	53.5	54.7	52.1	2.61	2.62	2.60
Buying sprees	51.5	45.3	58.3	1.29	1.33	1.25
Lability of interest in activities	50.5	37.7	64.6	1.65	1.60	1.68
Increase in sexual ability	50.5	54.7	45.8	2.43	2.79	1.95
Working more than 8 hours a day	46.5	50.9	41.7	2.55	2.48	2.65
Supersensitivity to bright lights	45.5	35.8	56.3	2.74	2.74	2.74
Increase in pleasant taste sensations	43.6	45.3	41.7	2.70	2.46	3.00
Heightened sense of sound	42.6	43.4	41.7	2.67	2.70	2.65
Temper tantrums	42.6	39.6	45.8	1.65	1.57	1.73
Feeling very angry	40.6	45.3	35.4	1.83	1.79	1.88
Thoughts of suicide	29.7	22.6	37.5	1.63	1.58	1.67
Heightened brightness of colors	27.7	28.3	27.1	2.50	2.60	2.38

Fitness and Recovery

PATRICIA A. MURRAY, P.E.D.

Analysis of the literature shows that many alcohol treatment administrators are adding to their programs a fitness component designed to care for alcohol patients through the recovery process.

Although researchers are still investigating whether exercise per se plays a significant role in the recovery process, it appears that physical fitness training has a place in alcoholism treatment programs. In fact,the available evidence suggests that physical activity and exercise can provide a beneficial adjunct for alcoholism and substance abuse programs (Taylor et al. 1985). Research also shows that a fitness component probably alleviates some symptoms associated with mild to moderate depression, improves self-image, develops social skills and cognitive functioning, reduces the symptoms of anxiety, alters aspects of coronary-prone (type A) behavior, and reduces physiological responses to stressors (Taylor et al. 1985).

The addition of various kinds of daily exercise to multidisciplinary treatment and counseling programs reflects a holistic approach to the care of the alcoholic patient. This philosophy differs from systems of medical care in which disease is isolated and treated. Proponents of holistic health define this approach as a system of preventive medicine that takes into account the whole individual and individuals' responsibility for their own well-being. Holistic approaches to wellness involve social, psychological, and environmental influences that affect health, such as nutrition, exercise, and mental relaxation (Dorland 1981).

Alcohol treatment programs incorporating the holistic approach are designed to treat the "whole" person and attempt to assist the patient in developing new thinking' patterns, new behaviors, and, subsequently, a new—and healthier—lifestyle.

This article reviews the promising new results from literature on fitness components in alcohol treatment programs. It also describes a program that incorporates an additional holistic dimension within traditional inpatient, outpatient, and aftercare treatment components of an alcoholism program.

THE CANADIAN STUDY

Research by David Sinyor and colleagues (1982) at Concordia University in Quebec offers empirical evidence suggesting that an exercise program helps in the rehabilitation of alcoholics. These Canadian researchers enlisted 58 inpatients of the Foster Alcoholism Rehabilitation Center in a 6-week program of daily exercise as part of a multidisciplinary treatment program that included daily intensive group therapy and counseling sessions. The researchers sought to determine whether alcoholics who participated in a graded fitness program showed the same kinds of physical and mental benefits that nonalcoholics experienced in similar programs. They also evaluated whether participation in a fitness program improved subsequent abstinence rates.

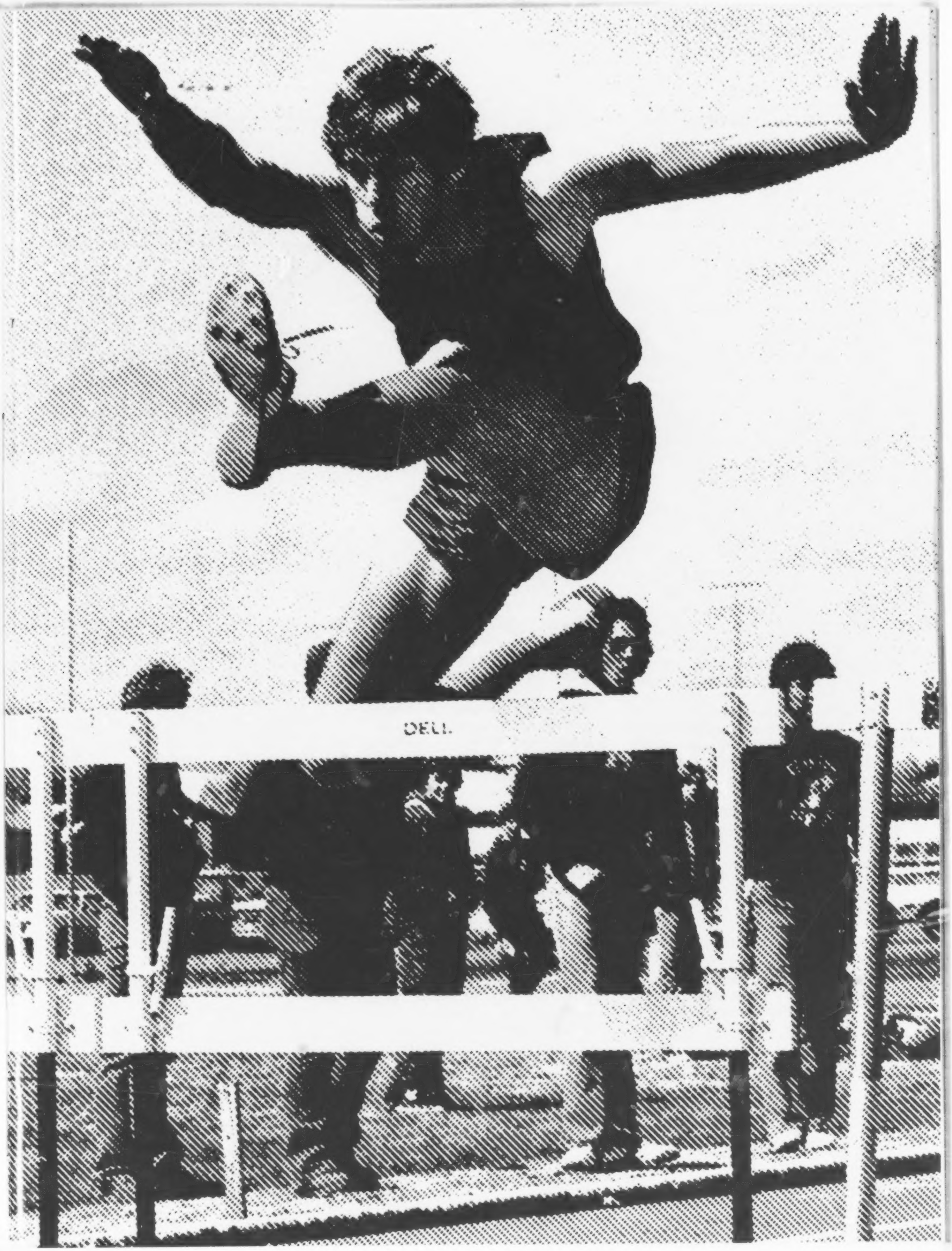
The 46 men and 12 women participating in the fitness component of the alcohol treatment program had a mean age of 42 years and an average of 11 years of formal education. About 60 percent were employed at the time of treatment—more than 50 percent as professionals, administrators, white-collar, or skilled workers and about 20 percent as unskilled workers.

Following a medical screening, two exercise groups were formed: one in which patients could participate fully and another in which patients with medical complications were permitted to participate at a lower level of intensity. Consisting of 1-hour sessions of progressively more vigorous activity, the fitness classes took place early each weekday morning. Each day began with stretching and warmup exercises, followed by light calisthenics and a 12-minute walk or run. The sessions ended with cool-down muscle-strengthening exercises.

Three months after completion of the treatment and exercise program, an independent team of researchers compared exercise-group patients' abstinence rates with those of two control groups: (1) patients who completed treatment but did not participate in the exercise component and (2) patients who were being treated at four other treatment centers in Quebec.

The findings, based on self-reports of abstinence corroborated by relatives and employers, suggest that those who participated in the fitness program had a greater likelihood of remaining abstinent than those in either of the two other groups. Results also showed that alcoholics who completed the fitness component experienced qualitative changes in fitness not unlike those found in nonalcoholics who exercise regularly.

The researchers found that 3 months after the end of treatment, 69.3 percent of those patients who completed the fitness program as part of their treatment (n=87) were abstinent. In contrast, only 38 percent of the patients (n=19) who did not participate in the exercise program and 36.9 percent of the 800 patients who completed treatment at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other centers in Quebec during the same period were abstinent at the 3-month mark. An 18-month followup study corroborated these findings, though the numbers of persons studied were much smaller. Interestingly, the 18-month followup showed that following departure from the center, most patients did not maintain their improved level of fitness.

Precisely why a fitness program helps in the rehabilitation of alcoholics is unclear, though numerous explanations are possible. For instance, laboratory research has indicated that an improved fitness level is associated with better skills for coping with stress (Keller 1980). In addition, regular exercise appears to be effective in alleviating anxiety and depression and may make the patient more receptive to psychotherapy (Griest et al. 1979; Ledwidge 1980). A third possibility is that participation in a fitness program helps reorganize an alcoholic's leisure time, leading to development of new activity patterns that may make the transition back to the working world less traumatic (Sinyor et al. 1982).

"HIGH-LEVEL WELLNESS" IN RECOVERY

Robert Bartha and Tom Davis (1982) of Ohio State University's Department of Counseling and Guidance advocate a holistic approach to treatment, including a fitness component. These authors believe that a fitness program helps to educate the alcoholic in the benfits of health-enhancing behavior and motivates recovering alcoholics to adopt a lifestyle that promotes what they term "high-level wellness." Rather than a total dependence on doctors and drugs to heal disease, this wellness approach emphasizes a lifestyle promoting "healthful existence in all areas of one's life." Bartha and Davis recognize the following five dimensions of high-level wellness that they say address the complex problems associated with alcoholism:

1. *Nutritional awareness*—identifying personal dietary deficiencies and learning about the basics of proper nutrition
2. *Physical fitness*—understanding the physical and mental benefits of exercise and general care of the body
3. *Stress management*—recognizing the prevalence of stress in one's daily life and acquiring techniques to deal effectively with these stresses
4. *Environmental sensitivity*—gaining awareness of one's physical, social, and personal surroundings
5. *Self-responsibility*—recognizing one's personal responsibility for individual health and well-being, the overriding dimension of the wellness philosophy.

"Commitment to change in these areas would incorporate the whole individual into the healing process, leading not only to absence of disease but also to promotion of health," according to Bartha and Davis (p.30). For instance, the authors say that the wellness approach can help the individual to assess and improve eating habits and to follow a more healthy diet. This behavior change can be important in alcoholism treatment because chronic alcohol abuse has been shown to alter metabolism and affect organs necessary for proper digestion and absorption of nutrients. Thus, nutritional habits of the recovering alcoholic must be assessed and improved. (See article on page 33 for more on the role of nutritional therapy for recovering alcoholics.)

THE EFFECTS OF JOGGING ON ALCOHOLISM RECOVERY

Vivian Gary and Dixon Guthrie (1972), of California's Metropolitan State Hospital in Norwalk, studied how jogging a mile a day for 20 days affects hospitalized alcoholics. Twenty male patients were evenly divided between an experimental and a control group. The ages of the recovering alcoholics ranged from 25 to 55 years (mean 38.9); those of the controls ranged from 39 to 56 (mean 45.1). Both groups had averaged 18 years of excessive drinking.

Analysis of fitness test results and behavioral measure scores showed that after only 20 days of participation in the jogging program, even alcoholics with long periods of alcohol abuse attained significant improvement in cardiovascular fitness. The most significant physical gain for the exercising group was a lowered pulse rate, suggestive of a healthier condition of the heart. The exercising alcoholic group reported reduced sleep disturbances during the training period, a benefit of jogging that should not be overlooked. "The inability to get a good night's sleep is a common complaint of alcoholic patients in the hospital and contributed in some to the build up of stress which led to drinking episodes . . . Although in the beginning, jogging may increase sleep disturbances because of muscle soreness, an overall improvement can be noted" (Gary and Guthrie 1972, p. 1077).

F. D. Harper (1979) developed a treatment approach, called joggotherapy, based on his view that jogging can be beneficial as adjunct therapy for a variety of problems, including alcoholism. According to Harper, jogging not only can support the recovery process by improving general physical fitness but also, because of its potentially addictive nature, can replace the negative addiction of alcoholism.

Though data on the "addictive" effects of running or other exercises is sparse (Taylor et al. 1985), addiction to running has been characterized as a form of neurosis (Little 1979). One such study by Morgan (1979) described eight persons with "running addiction" in whom commitment to running assumed a higher priority than commitment to work, family, interpersonal relationships, and medical advice. Still, it is not clear that the running causes the negative behavior or that certain personalities may be predisposed to abuse running as a way of avoiding or perhaps even coping with other problems (Taylor et al. 1985).

THE PSYCHOLOGICAL BENEFITS OF EXERCISE IN ALCOHOL TREATMENT PROGRAMS

A study by Alan Frankel and John Murphy (1974) showed positive changes in depression and other subscales of the Minnesota Multiphasic Personality Inventory (MMPI) among alcoholics participating in a 12-week physical fitness program. Frankel and Murphy's subjects were 214 alcoholics at an average age of 45 years who were in poor physical condition. All had been accepted into the Salem, VA, Veterans' Administration Hospital alcoholism treatment program, which is based on a traditional sociopsychological model. Specifically, it emphasized group psychotherapy, work assignments, education, family counseling, individual therapy, and a physical fitness program. The exercise component of the program consisted of 1-hour sessions, 5 days a week for 12 weeks. Each session began with 10 minutes of warmup activities, followed by 20 minutes of light calisthenics and tolerance-building activities. The next 15 minutes were devoted to individual strengthening activities, and the final 20 minutes consisted of cardiopulmonary development. The patients were tested at entry and exit from the program on 19 variables of two types: physical fitness and personality, as measured by the 13 standard scales of the MMPI.

Analysis of the results shows that on 15 of all 19 variables, participants in the exercise program underwent substantial changes. Most significant among the changes were decreases in depression and blame projection that were correlated with performance-based increases in physical fitness.

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NUTRITION AND RECOVERY

Alexander Tucker

Although it is uncertain at this time whether or not recovering alcoholics require more than the recommended daily allowances for all nutrients, it is clear that proper nutrition can play an important role in the aftercare of recovering alcoholics.

Alcoholism has been called the "chief cause of vitamin deficiency among civilized people with adequate food supplies" (Leevy and Baker 1968, p. 1325). In fact, alcoholism generally is associated with both malnutrition and vitamin deficiencies—conditions that can lead to a variety of symptoms and complications, including the development of liver disease (Lieber 1985; Mezey and Santora 1979; Pimstone and French 1984).

Chronic alcohol abuse and its effects also can alter significantly the body's ability to convert vitamins into metabolically active forms and can interfere with the absorption, transport, and tissue storage of a variety of nutrients. Such changes in the way the body uses nutrients from foodstuffs can lead to deficiencies of organic and inorganic nutrients—even in the recovering (abstinent) alcoholic. These results include protein deficiency, thiamine, riboflavin, niacin, folic acid, and pyridoxine depression and deficiencies in vitamin A, magnesium, potassium, zinc, calcium, iron, and glucose (Gastineau et al. 1979; Halsted 1976; Olson 1973; Somogyi and Kopp 1976; Spencer and Kramer 1986).

THE ROLE OF NUTRITION IN RECOVERY FROM ALCOHOLISM

It is now clear that both nutrition therapy for the alcoholic and education into the importance of proper nutrition for the recovering alcoholic can prevent or ameliorate nutritional deficiencies associated with a history of chronic alcohol abuse (Yung and Gordis 1982).

Such nutrient deficiencies may reflect a deficient food intake, per se, or a lack of a specific group of foodstuffs. The diet of an alcoholic generally is characterized by displacement of an increased percentage of calories by nutrient-poor alcoholic beverages (Gastineau et al. 1979). In addition, malabsorption of nutrients because of alcohol-induced damage to the intestinal mucous membrane is a key factor in the malnutrition that so often accompanies alcoholism (Jian and Modigliani 1980; Thomson et al. 1982).

For many recovering patients, a regimen that includes vitamin supplements can help repair many types of ethanol-induced tissue damage. It has long been known, for instance, that vitamin E (found in wheat germ oil, cereals, egg yolk, and beef liver) and other so-called antioxidants contained in such foods as vegetable oils can partially reverse the damage of ethanol-induced fatty liver. This beneficial effect appears to be a result of the vitamin's ability to inhibit or prevent accumulation of lipid triglycerides in the liver (Di Luzio and Hartman 1967; Di Luzio and Stege 1977). Indeed, research shows that uncomplicated cases can be reversed completely through nutrition therapy and abstinence from alcohol (Lieber 1985).

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Back to Work

Vocational Recovery

Laura Ronan, M.P.H.
Walter Reichman, Ed.D.

For an alcoholic, the loss—or threat of loss—of a job often serves as a breaking point in the denial that is characteristic of alcoholism. Thus, the return to the workplace can serve as an index of recovery and can lead to renewal of a stable sense of identity.

It has been demonstrated consistently that occupational stability is a major factor in maintaining sobriety (Dyszlewski and Dyszlewski 1981; Mayer and Myerson 1970; Ogborne 1978). In view of such findings, the Criteria Committee of the National Council on Alcoholism (NCA) added "the resumption of work without excessive absenteeism" to its list of standards by which it defines recovery from the disease of alcoholism (National Council on Alcoholism 1972).

A small but growing body of research on issues related to the vocational rehabilitation of individuals recovering from alcoholism suggests that vocational counseling can be crucial in overcoming the substantial barriers most recovering alcoholics face as they attempt to reenter the world of work (Britten 1984; Owen and Spicer 1981; Reichman and Young 1982). The findings also imply that successful reentry into the workplace should be a goal introduced very early in the recovering alcoholic's treatment.

This article will first identify some barriers to vocational recovery and then will introduce an approach to vocational counseling for the recovering alcoholic. A final section will review the unique vocational rehabilitation issues faced by recovering alcoholics identified and treated under the auspices of an employee assistance program (EAP).

Barriers to Vocational Recovery

Individual differences among recovering alcoholics probably are most apparent during their struggle to reenter the workplace, and the barriers they encounter will vary. For nearly all recovering alcoholics, however, returning to work entails some degree of risk taking. The barriers to be overcome are imposed both by society and by the individuals themselves.

Employer discrimination often is considered the principal barrier to recovering alcoholics seeking employment. They are seen as poor risks, not worthy of investment in job training or a job offer. Since 1973, alcoholics and drug addicts have been considered "handicapped individuals" under Section 504 of the Rehabilitation Act, which affords them certain civil rights and protection against discrimination in employment and education. This legislation, however, has been neither aggressively enforced nor widely acknowledged in the alcoholism community. In fact, the biggest obstacle may be that many recovering alcoholics are not aware that they are protected by the Act (Forcier 1982, 1985).

The effects of heavy and prolonged drinking may, in some cases, diminish the recovering alcoholic's ability to compete effectively in the marketplace. Skills involving memory, perceptual capacities, abstracting abilities, and motor performance needed in many jobs may have been adversely affected by alcoholism (Masterson 1982). The problem of impairment is particularly burdensome if the recovering alcoholic is unaware of the residual effects of alcoholism or does not know how to compensate for these deficits.

Some recovering alcoholics may lack clearly defined employment goals, either because alcoholism has hindered their career development and planning or because when their lifestyles are changed by sobriety, past goals are no longer suitable. The absence of realistic employment goals also may deter the recovering alcoholic from taking positive steps toward returning to work.

Apprehension about revealing one's alcoholic past can inhibit the recovering alcoholic's ability to obtain employment. A decision not to disclose past dependence on alcohol is contrary to the honest behavior advocated for therapy and by Alcoholics Anonymous (AA). Nondisclosure also perpetuates stigmatization. But a decision to be honest about the past carries with it the possibility of being disqualified as a candidate for a job (Forcier 1982). Other issues that may further confound the recovering alcoholic's struggle with this decision include inexplicable periods of unemployment, the dread of being "discovered" at some future time, and poor references from previous employers.

Work itself is known to be therapeutic. It serves as a process through which recovering alcoholics may regain a sense of self-esteem and dignity. However, the *lack* of self-esteem, feelings of helplessness, and the dependency characteristic of many recovering alcoholics often hinder their occupational stability. Confidence and the ability of the prospective employees to describe their skills, work histories, and job interests are key factors in obtaining employment and in competently executing job responsibilities. Without an opportunity to regain positive self-concepts through employment, recovering alcoholics may be immobilized.

National Agricultural Library

In many cases, the decision about when to return to work is critical. Premature reentry may precipitate relapse, especially if the job is a source of stress. Once the recovering alcoholic has controlled the drinking, feelings of anxiety, depression, and inadequacy may arise that previously had been suppressed by alcohol. The resulting internal conflicts may negatively affect the recovering alcoholic's work performance. Finally, with a positive self-concept reformulated, the sober alcoholic may experience a sense of occupational disenchantment because of changes in goals, expectations, and lifestyle (Reichman and Young 1982).

Recovery is a lifelong process that continues after the employee has returned to the work environment. On the job, the recovering alcoholic may continue to confront obstacles to a smooth transition. Again, both internal and external factors can contribute to the problem. For example, following the daily routine required for full-time employment may be difficult for the recovering alcoholic who exercised little self-discipline prior to recovery. Also, establishing and maintaining positive interpersonal relationships with coworkers may pose problems. Dealing effectively with a stigma is especially important when cooperation with peers is essential to job performance; yet, the sober alcoholic may find it difficult to distinguish between subjective insecurities and the reactions of fellow workers and supervisors.

VOCATIONAL REHABILITATION OF THE RECOVERING ALCOHOLIC

The vocational rehabilitation of persons recovering from alcoholism has been neglected by professionals in both employment and training and in the alcoholism treatment fields (Forcier 1985). According to some observers, members of different professions show reluctance to go beyond their principal mandates, each expecting the other to assume responsibility for these services (Britten 1984). Alcohol treatment programs generally seek alcohol abstinence and participation in AA rather than successful employment as their goals for clients. And most vocational rehabilitation programs are not equipped to address the special needs of the alcoholic.

The Vocational Rehabilitation Act of 1973 was designed, in part, in recognition that sources of funding in addition to alcohol treatment resources should be available for the rehabilitation of alcoholics. Congress stated that, where possible, other funding sources should be used through cooperative agreements or other means (Forcier 1982). In response to this Congressional stimulus, some linkages between the two fields are developing. For example, the Employee Program for Recovering Alcoholics (EPRA) located in New York City is operated by the local National Council on Alcoholism with funding from State and city departments of vocational rehabilitation and employment. (See article, p. 38.)

VOCATIONAL COUNSELING FOR THE RECOVERING ALCOHOLIC

To be effective, vocational counseling must be structured to meet the needs of the individual recovering alcoholic. Reichman, Levy, and Herrington (1979) underline the need for personalized vocational counseling that takes into consideration the age and sex of the client; occupation before and during the period of heavy drinking; and changes in the self-concept as a function of recovery, education, and maturation. On the basis of client-employment needs, the authors identified the following four types of alcoholics seeking vocational counseling:

To be effective, vocational counseling must be structured to meet the needs of the individual recovering alcoholic.

1. Postsobriety goal setters, who first recognized the need for career goals during early sobriety.
2. Individuals with inappropriate career goals, who chose goals early in their lives.
3. Individuals with uninterrupted career patterns, who wished to return to their previous careers.
4. Dead-end flounderers, who never had any career goals and were not motivated to develop them.

POSTSOBRIETY GOAL SETTERS

In the early stages of sobriety, the postsobriety goal setter begins to think about returning to work. For the first time, a lifelong career plan is established. This is an exploratory stage of vocational development roughly equivalent to that of a high school senior. Classical vocational counseling with minor adjustments will greatly benefit this type of recovering alcoholic. The recommended process for effective vocational counseling with recovering alcoholics consists of the following progression:

- A positive self-concept is developed through exploration of the client's goals with the counselor, using results of aptitude, interest, and personality tests.
- To foster independence and self-responsibility, the client independently gathers occupational information from a variety of sources, using vocational games, computer-assisted instruction, and other methods. The postsobriety goal setter may display ambivalence by resisting the information-gathering task but, with counseling, may be able to understand the reasons for this ambivalence.
- The client's needs and self-concept are translated into realistic occupational terms through covert and overt roleplaying, reality testing, compromise, and planning. The positive interaction between the counselor and the client is essential to the translation process.
- The client follows through with career development by writing a resume and letters of inquiry, preparing to interview, preparing to accept rejections, and persisting in the job search.

After employment has been found, it is beneficial for clients to know that they can confer with their counselors during the early stages of adjustment to their new jobs.

INAPPROPRIATE CAREER GOALS

Early in their lives, individuals in this category chose inappropriate career goals that were not based on an accurate self-assessment. Sobriety helps these people recognize that their occupations are not suitable, despite apparent success. Recovering alcoholics in this category are similar to people in midcareer crises.

With supportive counseling that will allow them to explore and test their feelings and fears, they will recognize that they have special skills and aptitudes upon which to build. Of course, they also need technical help with identifying and getting a job.

Inappropriate goal setters are likely to discover their dissatisfaction only after returning to their old careers. Such individuals may find themselves angry, frustrated, and in danger of returning to drink. They may have difficulty recognizing the roots of their problems and often find sobriety the culprit.

UNINTERRUPTED CAREER PATTERNS

The third category of early sobriety is the easiest with which to deal because these individuals require a minimum of vocational counseling. They find their old jobs satisfying, and they still feel successful. In some situations, they may need assistance in dealing with the stigma associated with alcoholism and with the negative attitudes displayed by their coworkers and supervisors.

Clients in this category may decide to return to their old jobs. If this is impossible, they will need assistance to find a new job in the same occupation and to make a successful reentry.

DEAD-END FLOUNDERERS

The fourth category is named for the dead-end flounderer who had no career goals either before or after becoming an alcoholic and who does not form these goals even in sobriety. In many instances, the entire work histories of dead-end flounderers were built around booze, and the idea of a steady job or a succession of jobs that will form a career is alien to them.

It is difficult for career counselors to instill the need for career goals in people in this group; however, a vocational counselor can help these people to recognize what they do want out of life.

VOCATIONAL REENTRY AND EAPs

The previous discussion has addressed primarily the issues confronted by individuals who do not have an EAP in their workplace to support them in their vocational recovery. For those who were identified as alcoholic in the workplace and entered treatment under the guidance of an EAP, the problems of reentry are somewhat different.

Fortunately, in these instances the individual's supervisor and the EAP counselor—fully aware of the employee's circumstances—generally will ease reentry. However, despite sincere efforts to protect the confidentiality of the employee, it is almost inevitable that some coworkers will be aware that the returning employee has been treated for alcoholism. The supervisor may be unable to protect the recovering alcoholic from the stigma associated with alcoholism or to prevent its effect on relationships with coworkers.

Although, in some ways, reentering the same job is easier than seeking a new one, considerable anxiety may result from returning to the same environment in which one was so often drunk. Under these conditions, ongoing counseling should include help in responding to the jokes, embarrassment, and discomfort of others. It is important that the EAP counselor and the employee's supervisor be sensitive to this and other occupational stresses that the recovering alcoholic may experience upon return to the workplace.

Even recovering alcoholics who are supported through an EAP may find that a career once considered satisfying will lose its appeal after sobriety is achieved. Many large organizations also employ career counselors who can assist the disenchanted recovering alcoholic in dealing with this problem. Helping an employee seek another career or to find a postion in a different organization or in a different part of the same organization may be percieved as detrimental to the organization. However, if the individual's occupation is not congruent with the new values, interests, and lifestyle of the recovering alcoholic, the dissatisfaction that will result will harm the organization as well as the individual (Reichman and Young 1982).

THE NEXT STEPS

This article has focused on the many barriers facing recovering alcoholics in their efforts to reestablish themselves in the workplace. Because only limited knowledge is available on overcoming these problems, there is a need for additional research on the role of the workplace in the employee's recovery from alcoholism. Areas in which further research is needed include the behavioral and emotional changes experienced by recovering alcoholics, the effects of the organizational environment with regard to the recovery process, the part played by coworkers in return and followup, and the role of the employer in promoting recovery. ■

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EPRA: HELPING RECOVERED ALCOHOLICS RETURN TO WORK

The Employment Program for Recovered Alcoholics (EPRA) provides comprehensive vocational rehabilitation services to unemployed recovering alcoholics who reside in New York City. At EPRA, men and women who are recovering from alcoholism seek to regain the confidence needed to find meaningful employment and to return to the mainstream of society. Founded in 1977, EPRA now serves approximately 240 recovering alcoholics annually.

AH&RW staff interviewed Richard P. Masterson, executive director of EPRA, to review the work of this nonprofit agency. During the past 9 years, EPRA developed, tested, and refined its vocational rehabilitation method for recovering alcoholics. In its efforts to help sober alcoholics to return to work, EPRA also taps resources outside the alcoholism treatment community.

AH&RW: *What led to the establishment of EPRA?*

EPRA grew out of the recognition that recovering alcoholics frequently have unclear ideas of how alcoholism affects their work lives. Many have fragmented work histories, low self-esteem, and health problems that hamper vocational reentry. Others simply lack practical knowledge about how to look for work. EPRA supplies the appropriate skills and the psychological support system recovering alcoholics need to compete again in the job market.

Underlying all aspects of the EPRA rehabilitation process is the Alcoholics Anonymous (AA) principle of honesty as the foundation of sobriety. The basic tools we use are a blend of those developed by recognized experts in alcoholism treatment and in rehabilitation counseling.

AH&RW: *What are the phases involved in the EPRA vocational recovery process?*

1. Evaluation and Assessment

Twenty recovering alcoholics participate as a group in a 4-week evaluation and assessment intended to help each one objectively review individual employment options. A battery of tests is administered to determine aptitude, basic educational and communication skills, interests, and abilities. In addition, professional vocational counselors then help each client honestly assess medical, psychological, social, and vocational barriers to employment. At the end of this phase, program participants are able to make realistic decisions about their vocational futures.

Richard P. Masterson, Executive Director, EPRA

The evaluation component is structured so that each client attends classes and discussion groups from 9 a.m. to 1 p.m., 4 days each week. Individual counseling sessions are scheduled during the afternoon. A participant who is late or absent more than once during this 4-week period is required to begin the program again. The regular schedule and program standards are effective methods of reorienting the recovering alcoholic to the daily demands of a job.

2. Transitional Work Program (TWP)

During this phase, the client holds a part-time job at a nonprofit organization while continuing to attend job-preparedness training. EPRA's participants work fulltime at a job site on Mondays, Tuesdays, and Wednesdays. They attend stress-management and assertiveness-training classes and individual counseling sessions at EPRA headquarters from 9 a.m. to 5 p.m. on Thursdays and Fridays.

The goals of this phase include the following:

- To develop positive attitudes and work disciplines
- To make the transition to a structured work routine and manage work-related issues
- To restore confidence in one's abilities and learn how to deal with on-the-job problems
- To develop stress-management techniques and assertiveness skills.

EPRA has established close working relationships with a variety of nonprofit agencies in the New York City area. Their ongoing involvement and indepth understanding of the program help them provide the type of work experience needed by the recovering alcoholic at this stage.

3. Job Skills Seminars

This phase consists of intensive classroom work and study aimed at developing and regaining the recovering alcoholic's "employability skills." With the help of vocational counselors, EPRA's clients write resumes, learn techniques for effective job search, and acquire interviewing skills. Designed to develop recovering alcoholic's skills to present their backgrounds effectively, the training is completed within 4 weeks. Emphasis is placed on developing interviewing skills that enable recovering alcoholics to present their work records honestly and as favorably as possible. Roleplaying sessions are videotaped for discussion, and trial interviews are conducted at EPRA offices with employers from the New York City business community.

4. Job Search

EPRA's participants have a choice either to be referred to potential employers who have been contacted by EPRA job development staff or to develop their own job leads with the assistance of EPRA counselors. Approximately 50 percent find employment via interviews initially arranged by EPRA, and the rest find jobs on their own initiative.

EPRA preserves confidentiality under all circumstances unless the client gives consent to do otherwise. Through the counseling received at EPRA, participants are equipped to make their own decisions about when, where, and to whom they disclose their history of alcoholism.

AH&RW: *What are the eligibility criteria for acceptance into EPRA?*

To be accepted into EPRA, an individual must meet the following eligibility criteria:

- Abstinent from alcohol and mood-changing drugs for a minimum of 90 days
- Unemployed and a resident of New York City
- At least 18 years of age or older
- Free from active medical conditions or psychiatric symptoms that would pose serious limitations to employment
- Involved in a program of recovery or other acceptable therapy.

AH&RW: *How does EPRA identify jobs for its participants?*

More than a year before accepting clients, we marketed the program to potential employers to identify opportunities for placement in the New York City area.

Education about alcoholism and its treatment were the first steps taken to combat the stereotypical image of recovering alcoholics as employees. We discovered that direct contact with members of our program was an effective method of dispelling misconceptions about alcoholism. When EPRA's clients who had agreed to disclose their alcoholism began interviewing for positions, many employers had their first experience interviewing a qualified applicant who had revealed a history of alcoholism.

Over the years, we have established positive relationships with many New York City companies. Initially, we pursued companies with Federal contracts subject to the Rehabilitation Act of 1973 (see article, p. 34). Today, we have more interested employers than we have graduates. About 50 percent of our members find jobs without the direct assistance of EPRA. EPRA's clients are now working in business, industry, public service, and the arts in positions that range from the mailroom to the executive suite. American Society of Composers, Authors, & Publishers, Bankers Trust, Citibank, New York Public Library, and Perfect Courier, Ltd. are among EPRA's participating employers.

AH&RW: *Where does EPRA's financial support come from?*

EPRA was started with a small grant from the Union Carbide Corporation to the National Council on Alcoholism (NCA). The cofounders of EPRA were Mr. R. Brinkley Smithers and Mr. John Beard. Today, EPRA operates with an annual budget of $500,000. Since its second year of operation, EPRA has been under the administrative guidance of the Alcoholism Council of Greater New York.

Through persistent advocacy for the vocational needs of recovering alcoholics, New York State and city departments of alcoholism, employment, vocational rehabilitation, and education are all current sources of financial support. The funding we receive from the New York State Office of Vocational Rehabilitation establishes a precedent for State vocational rehabilitation services to funnel dollars to programs that counsel recovering alcoholics. They have consistently found that a program such as EPRA is more effective than other settings for helping recovering alcoholics to reenter the workplace.

Throughout our history we have received generous contributions from private corporations, foundations, and individuals. Our alumni are regular contributors.

AH&RW: *How do EPRA's participants learn about the program?*

Initially, most of the referrals came from New York's alcoholism treatment centers and other rehabilitation facilities. Then, gradually the news of EPRA spread through the network of AA groups. Now most of our referrrals are word-of-mouth. Although we do not actively recruit participants, we regularly make educational presentations at treatment centers and at workshops in the area to continue to spread the word about the importance of establishing vocational recovery as a goal during early sobriety.

AH&RW: *How do the vocational rehabilitation needs of the recovering alcoholic differ from those without alcohol-related problems?*

The recovering alcoholic characteristically has low self-esteem and feelings of helplessness, dependency, and isolation. Some also are struggling to maintain sobriety. Because of such drawbacks, the Rehabilitation Act of 1973 was amended in 1978 to acknowledge explicitly that alcoholism is a handicap, entitling alcoholics to important safeguards against discrimination by employers. (See article, p. 34.)

Recovering alcoholics from many occupations, as well as many without an employment history, have been served by EPRA. Despite this diversity, most of EPRA's clients are at the adolescent stage of vocational development—they either have never selected career goals or had chosen inappropriate ones.

AH&RW: *Is it possible for an individual who has a minimum of vocational needs to skip some components of the program to expedite employment?*

During the period of the program's existence, we have refined the vocational rehabilitation process. From our experience, we find it beneficial to adhere strictly to the established process. Of course, all clients are made fully aware of the commitment they must make prior to entering this program.

Each participant receives regular and intensive individual attention that allows the particular needs of that person to be assessed and addressed. It seems consistently true that regardless of vocational history, each recovering person benefits in an individual way from each phase of the program.

AH&RW: *What factors have helped EPRA accomplish its objective?*

A combination of factors has contributed to EPRA's successful record of returning sober alcoholics to the workplace. First, the staff of dedicated and experienced alcoholism professionals, vocational counselors, and placement specialists deserves a large share of the credit. Second, the process of recovering from alcoholism, which is a major life crisis, gives the EPRA client qualities such as determination, stability, and personal insight that are essential ingredients for succeeding in this program and in the workplace. Finally, nearly all clients are actively involved with AA, which helps them to be strongly motivated, conscientious, eager to make contributions to society, and able to regain their sense of dignity.

AH&RW: *Is followup care provided?*

After obtaining a full-time job, the EPRA graduate is urged to attend regular evening

(continued on page 73)

Solving the Legal Quandary in Recovery

ALLAN LUKS, J.D.

In the 1970s, alcoholics gained the same legal status as Americans suffering from cancer, heart disease, tuberculosis, and diabetes: They could not be discriminated against because of their illness. By law, employers could no longer inquire as to whether a person was a recovering alcoholic; they could judge potential employees only by their ability to perform the job. In the 1980s, however, alcoholics are faced with legal problems in spite of such protection. Employers often still ask the question that was declared illegal the previous decade: Have you ever been treated for alcoholism? The quandary: Should the alcoholic tell the truth or lie?

The 1973 Federal Rehabilitation Act prohibited any private or public institution that receives Federal funds from discriminating against "handicapped" persons, and recovering alcoholics were included in that category. The overwhelming majority of Americans, however, work for nonfederally funded employers; and city, county, and State laws are integral counterparts to the Federal legislation.

In late 1977, for example, New York's city council passed a law preventing discrimination by employers against alcoholics "otherwise qualified" for specific employment. This led New York State to issue a similar regulation the next year. With the regulation, an employer could legally ask questions like, "Do you have an impairment which would interfere with your ability to perform this job?" But they could not ask questions to find out whether a person was a recovering alcoholic.

Except for the largest organizations with staffs responsible for monitoring affirmative action and disability rules, most employers rarely know that they cannot inquire as to whether a person has undergone alcoholism treatment. Organizations that use a standard set of questions—written or oral—to evaluate a present or potential employee's mental history often make the mistake of asking for information about past experiences with alcoholism. In fact, in 1984, almost 7 years after passage of the law in New York, the city's own personnel department was still using a form that asked applicants whether they had been treated for alcoholism. The department defended this practice, saying it was using up old forms.

Because I helped with passage of the 1977 New York City Council law, my telephone has rung regularly ever since with calls from recovering alcoholics as to whether they must answer this illegal question. This is a dilemma that troubles them legally, ethically, and psychologically.

One of the many calls I have received—calls which form just the tip of an iceberg—came from Mary, a 46-year-old recovering alcoholic. The illness had left her alone and without steady work for many years. With recovery, she slowly began to gain secretarial jobs, and she enrolled in law school. Finally, at age 46, she completed her biggest achievement—passing the New York State bar exam. All that was left before being able to practice was the character background review. This was what prompted Mary to call.

Applying for bar admission in the city's counties of Manhattan and the Bronx requires applicants to state whether they have ever "been a patient in any institution for the care of persons suffering from . . . drug addiction, drug abuse or alcoholism . . . . Failure to disclose any information can result in denial to the bar." Mary was terribly confused. She wanted to answer honestly. But what if her case was subsequently reviewed by someone who believed that alcoholics were not fit? She could risk her future by telling the truth. On the other hand, she had been in treatment and a member of Alcoholics Anonymous. She knew the importance of self-honesty in recovery. Also, she believed that a lawyer's role was to fight for the truth.

Mary's dilemma was published in the September 1985 issue of the newsletter of the Alcoholism Council of Greater New York. Subsequently, I met with the alcoholism committee of the New York City Bar Association on whether Manhattan and the Bronx could claim an exemption from the State regulation prohibiting such a question. It appeared that the character review committee might be able to claim such an exemption. Mary's decision still loomed: to lie and risk being discovered, or to tell the truth and risk being a victim of discrimination and being involved in lengthy and costly hearings.

Since she had been treated only as an outpatient, Mary decided she would say "no" to the question of having been in an institution for alcoholism. She passed the character review. But she still worries, no matter how remote the chance, that someone might challenge her interpretation.

By court decisions, an employer can refuse to hire or can subsequently fire a person who has lied to a question concerning alcoholism treatment, even though the question is illegal. The person can be terminated for having committed a misrepresentation. For example, a recovering alcoholic who answered falsely when applying for a job at a major national insurance corporation in New York had her employment ended.

On April 19, 1986, however, the New York State Division of Human Rights issued an opinion letter, at the request of the Alcoholism Council of Greater New York, concerning "whether a person may answer untruthfully preemployment inquiries deemed unlawful under the Human Rights Law." The division noted that if a recovering alcoholic answers the illegal question about being treated for alcoholism honestly and is denied a job, the alcoholic could have the right to bring a discrimination action. The improper question would be evidence of possible discrimination. An applicant also has the option of informing the interviewer that the question is illegal and can refuse to answer. If denied employment, the applicant can bring legal action. But, any action takes time to settle, a negative aspect for a recovering alcoholic trying to break into the job market. Also, employers will usually fight such complaints since none—small or large—wants to be found guilty of discrimination.

The Human Rights Division noted, however, that court decisions do exist that might eventually solve the recovering alcoholic's legal protection dilemma. For example, the division pointed to a 1977 case, *People v. R.G.* In this case, a teacher was repeatedly refused employment because of his affirmative answer to a question regarding a past criminal record. The minor crimes he had committed, however, were supposed to be "sealed" to the public by State law. The court ruled that the teacher could answer falsely that he had no criminal record to such employer questions because there was "a legislative intent to authorize negative answers to improper questions regarding arrests in employment applications."

The division hinted that such court rulings also could be issued in city and State tribunals on behalf of recovering alcoholics still being asked illegally about whether they have had this illness rather than about their ability to work. The legal challenge faced by alcoholics in the 1980s is to gain such declaratory judgments. Only then will the legal protection recovering alcoholics supposedly gained in the 1970s be implemented. ■

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Allan Luks testifying in 1977 in hearings that led to New York's first local laws to prevent discrimination against alcoholics.

Recovery from Alcoholism

Issues for Black and Native American Alcoholics

ARLEEN ROGAN

Alcohol abuse and alcoholism have long been major health problems among minority Americans, especially black and Native Americans. From data collected over the last decade, researchers have shown that minority Americans suffer disproportionately from the impact of alcohol-related problems. For instance, while rates for alcohol use among white and black Americans are comparable (69 percent versus 62 percent), as are rates of heavy drinking (22 percent versus 19 percent), the results of alcohol use and abuse are not. The prevalence of cirrhosis among black Americans is nearly twice as high as it is among white Americans, and alcohol is implicated in nearly 50 percent of black homicides (Williams 1985).

Overall, the Native American population is especially hard hit by alcohol-related problems. Although a high percentage of Native American women abstain from alcohol use—as do some tribes—the rates of heavy drinking among those women who do drink are high (Moss et al. 1985). This is reflected in the high incidence of alcohol-related problems among Native American women. For example, one in every four deaths in this group of women is caused by alcoholic cirrhosis, a figure 37 times the rate for white women (Moss et al. 1985). In the United States as a whole, the estimated incidence of fetal alcohol syndrome is 1 to 3 per 1,000 live births; among some Native American tribes, however, the incidence has been reported to be as high as 10.5 per 1,000 live births.

What can be done to alleviate these problems? This article will take a look at some of the relevant issues related to black and Native American recovery from alcoholism.

For the purposes of this discussion, recovery from alcoholism will be viewed as a three-stage process that (1) begins when the alcoholic recognizes and accepts the problem; (2) is carried forward by the act of stopping drinking; and (3) evolves into a period of personal and social adjustment that occurs as the person learns to live without alcohol. It is during this last phase that the alcoholic undergoes the series of internal transformations that affect perceptions of life, self-image, spiritual awareness, and ethnic pride (Moss et al. 1985).

A basic question to be asked is this: How large a role do cultural and racial factors play in the recovery process of minority alcoholics? In addition, the impact of ethnicity on drinking-related factors, personal traits, spirituality, and the role of Alcoholics Anonymous (AA) will be examined.

ETHNICITY AND RACE

The importance of providing culturally sensitive programming has been widely acknowledged, but recent reports suggest that helping minority alcoholics recover is not simply a matter of matching minority clients with minority counselors or developing programs that are culture specific. In addition to culture and ethnicity, programs must also pay attention to the drinking-related factors that impinge upon alcoholics regardless of heritage and to individual personality factors, some of which may be related to ethnicity or race and others which may be attributed to socioeconomic factors.

The role that ethnicity and race play in the development of alcohol problems and in the treatment and recovery process for minority alcoholics is the subject of continuing research and debate. One expert suggests that, as people become increasingly dependent upon alcohol, they give more priority to drinking and being intoxicated and less to family and other members of their social network (Westermeyer 1984). As a result, people who are dependent on alcohol or other drugs "come to share a group of values, attitudes, and behaviors that are remarkable in their similarities. Individual differences begin to blur" (Westermeyer 1984, p. 13).

During the early stages of recovery, the person who has been dependent on alcohol or other drugs for long periods of time experiences what Westermeyer (1984) refers to as *post-treatment anomie*, that is, the loss of a sense of the world and the person's role in it. Thus, the person is both psychologically and socially disoriented. This, Westermeyer argues,

> *suggests that substance abuse is not resolved merely by psychological resolution . . . but by the evolution of values, attitudes, and behaviors not related to substance abuse. (p. 15)*

During recovery, the minority alcoholic must achieve one of two tasks: either resume abandoned values, attitudes, and beliefs or acquire new ones to replace the alcohol subculture.

RESPONSE TO TREATMENT

Studies suggest that ethnicity, culture, and racial factors can play a role in shaping the individual personality traits that affect a person's response to treatment and to long-term recovery. In one study on this subject,

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Hurlburt and Gade (1984) compared the personality traits of alcoholic Native American women and Caucasian women to determine why Native American women tended to respond less positively to traditional alcoholism counseling than did their white counterparts. They found that Native American women scored higher than white women on tests that measured resistance to "white man's" authority. Thus the effectiveness of white counselors in providing services to Native American women can be inhibited. However, Native American women who had been sober for more than 6 months and who participated in AA scored higher than their white counterparts in willingness and ability to seek out social supports. Hurlburt and Gade conclude that in reaching Native American women during the early stages of recovery, it might be important to rely on counselors who are of the same ethnic background, thereby reducing "any perceived 'white man's' external authority."

Minority status may also account for differences in how black female alcoholics respond to treatment. For example, four studies report that black alcoholic women in treatment are both more belligerent and more anxious to avoid pain than their white counterparts (Gary and Gary 1985). White female alcoholics tend to be more sociable and more open to new experiences. These differences may be a result of the social status assigned by American society. As Wirth noted, "minority status carries with it the exclusion from full participation in the life of society" and may explain why black women are more hesitant to participate in the treatment process (cited in Westermeyer 1984, p. 11).

Spirituality

Spirituality, religion, and the church are important life features for both blacks (Hudson 1985; Knox 1985) and Native Americans (Jilek-Aall 1981). Sensitivity to this fact on the part of alcoholism treatment programs and professionals serving these populations may enhance the recovery process for their clients. By acknowledging, for instance, that black clients might be likely to seek the assistance of a spiritualist, counselors can improve the counseling relationship and at the same time tap into a source of the client's inner strength (Knox 1985). In addition, the minister and members of the patient's church may serve as valuable resources for the therapist (Knox 1985).

Drinking-Related Factors

Although most researchers agree about the importance of the resumption of prior ethnic and cultural roles in the recovery process for minority clients, Moss and his colleagues (1985) argue that sensitivity to cultural issues is not pivotal in the first stage of recovery. During this period when the alcoholic is coming to terms with the disease, drinking-related factors assume a greater importance. In a study of 99 Native American alcoholism counselors (71 of whom were recovering from alcoholism themselves), these researchers found that 80 percent cited three factors that were crucial to obtaining sobriety: (1) recognition and acceptance of the problem, (2) awareness of the reasons for drinking, and (3) motivation to refrain from drinking. Fewer than 50 percent of the respondents cited ethnicity as a significant factor during this period (Moss et al. 1985).

This study revealed a number of other factors that participants thought were

Ross Laboratories

important to the recovery process, including gaining an appreciation for life, spiritual awareness, improved self-image, and pride in one's heritage. The extent to which any program can foster these characteristics will determine how successful it is in helping clients. Moss and associates conclude, however,

> *programs that attempt to place personal/social adjustment factors first in the recovery process will be less successful in helping alcoholics in attaining sobriety than programs which place a heavy emphasis on actual drinking factors. (p.91)*

THE ROLE OF ALCOHOLICS ANONYMOUS

The role of AA in the recovery process of blacks and Native Americans has also been debated in the literature. However, recent studies (Hudson 1985; Hurlburt and Gate 1984; Jilek-Aall 1981; Moss et al. 1985) cite AA as a successful recovery program for minority Americans. Its success seems to stem from the fact that it is a self-help program that allows minority group members to develop self-esteem (Hudson 1985; Moss et al. 1985). Because the format for AA meetings is relatively unstructured, and the actual course of a meeting is left to the discretion of the participants, members can develop culturally sensitive programming while maintaining traditional AA principles.

Jilek-Aall (1981) reports on the success of AA among the Coast Salish people who reside in Washington State and British Columbia, noting that AA meetings serving this population differ significantly from meetings serving people in urban settings and from meetings whose participants are white. These AA meetings, for example, are not limited to the recovering person but also are open to other members of the family such as spouses and children. The formats of the meetings also adhere less to majority culture notions of time and are much more unstructured. People come and go as they please, and participants are encouraged to speak for as long as they wish. This loose structure allows the Coast Salish AA group to incorporate cultural activities as part of the program.

According to Hudson (1985), Alcoholics Anonymous appears to be successful as a recovery mode for two basic reasons: (1) the nature of the disease—which carries with it the failure of role performance and social isolation—and (2) the nature of the AA fellowship, which provides a structured resocialization process and easy access to a social network. These factors contribute to the apparent success of AA with many alcoholics, including members of minority groups. In addition, Hudson notes that AA is a spiritual fellowship—which offers a strong appeal for blacks because it mirrors a significant black cultural value.

CONCLUSION

Although there are many unanswered questions about how best to incorporate culturally and racially sensitive features into an alcohol recovery program, it seems clear that these factors do play a role in the recovery process for minority Americans. Thus, professionals and program planners cannot afford to be color blind if they wish to assist minority clients (Gary and Gary 1985).

Recovery is, by and large, an internal process that requires a psychological shift on the part of the client who is struggling to develop alternative coping mechanisms. Programs that help a client by fostering self-esteem and by encouraging clients to assume responsibility for their lives facilitate the psychological growth essential to ongoing sobriety. Programs that acknowledge all aspects of a person, including one's cultural and racial identity, are likely to foster a sense of self-pride that will assist a person through the journey to long-term sobriety. ■

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Issues Relevant to Aftercare Programs for Women

Brenda L. Underhill, M. S., C.A.C.

Women's unique needs in recovery and the need for all-women programs remain controversial topics in the field of alcoholism. The generic approach of "an alcoholic is an alcoholic is an alcoholic" is far from being discarded. One of the reasons for the continuing controversy is the gap between research and experience. Although difficulties in obtaining a proportionate amount of funds for research on women's needs result in a lack of research-based knowledge, women-only programs have provided a wealth of clinical experience about the needs of women in recovery.

This article will provide an overview of the programmatic implications of women's recovery needs beyond initial sobriety and initial treatment. The discussion will draw upon both some empirical data on women with alcohol problems and the collective experience and knowledge developed from the Alcoholism Center for Women in Los Angeles and from other women's programs previously funded by the National Institute on Alcohol Abuse and Alcoholism (Volpe 1982/1983).

Because women's lives differ significantly from those of men in our culture, both early recovery and aftercare programs for women need to base the design and the delivery of their services on the realities of women's lives and the problems specific to women with alcohol problems.

The greater social stigma attached to women with alcohol problems as compared with male alcoholics has been well documented in the literature (Beckman 1975; Blume 1978; Marden and Kolodner 1980; Sandmaier 1978). As Sandmaier (1980, p.9) points out: "She is likely to internalize her culture's harsh judgment of her and learn to view herself with hopelessness and hatred." Alcoholic women also have lower self-esteem than male alcoholics (Beckman 1978). Staff need to be educated about such social forces that affect women's lives.

This problem of lower self-esteem is not limited to early sobriety; it is a continuing issue for women in recovery. On a programmatic level, this means that services from outreach to aftercare must be oriented toward increasing self-esteem and self-acceptance as a woman. Attack therapy and highly confrontive counseling techniques are counterproductive to this goal. Stere (1985) offers some specifics in terms of self-esteem training exercises on both individual and group levels that service providers may find useful.

It is important for both recovering women and staff to understand the concept of learned helplessness (Abramson et al. 1978; Walker 1979). When an organism is repeatedly exposed to stressful conditions and no behavior on the organism's part can reduce or control the stress, learned helplessness can result. This concept has obvious application to all women in relation to gender discrimination. Providing women with information on learned helplessness is a way to reduce the internalized self-hatred that results from such pressures as gender-based, socialized dependency patterns; physical abuse; and the emotional pain of growing up in an alcoholic family.

Healthy self-esteem also involves being able to assert one's needs and to deal effectively with anger. To that end, offering assertion training and anger groups is productive in facilitating long-term recovery. For most women, whether they are alcoholic or not, this is new behavior. Women, by and large, are socialized to be other-directed, while men are not. Miller (1976) puts the problem this way:

> *Women constantly confront themselves with questions about giving. Am I giving enough? Can I give enough? Why don't I give enough? They frequently have deep fears about what this must mean about them . . . By contrast, the question of whether he is a giver or giving enough does not enter into a man's self-image. (p. 46)*

Similarly, anger groups can assist women in overcoming societal conditioning that discourages women from directly expressing anger as a feeling. As Kaplan and colleagues (1983, p. 31) state, "The expression of anger can come to be equated with precipitating loss, not just of another person, but more importantly of one's self-esteem—one's capacity to maintain relational ties." Thus, recovering women may previously have been unable to express anger at all or could express anger feelings only in an aggressive way. Anger groups offer women a chance to learn with other women how to express legitimate anger as well as how to stay sober. In designing these groups, providers need to be aware of possible cultural and ethnic differences in styles of communicating anger (Kochman 1981).

Other issues important to the continuing recovery process for women are incest, battering, child sexual abuse, and sexual assault. Accurate data on the prevalence of these problems in alcoholic women are still incomplete; however, available statistics suggest that the percentage of women in treatment who report previous abuse range from 40 to 74 percent (Covington 1982; USDHHS 1983). Covington (1982) has observed:

Harper Hospital

> *So as we look at these preliminary statistics on the sexual function and abuse experiences of alcoholic women, we see that we can no longer ignore these issues in treatment. For the majority of these women, this has been part of their life experience and it is part of the shame and guilt and degradation that contributes, along with the stigma of alcoholism, to their lower self-esteem. (p. 6)*

Early recovery must focus on staying sober one day at a time. During this period, a woman has not developed the coping mechanisms necessary to deal with the overwhelming pain and fear that accompany sexual abuse. But the message that the abuse did not happen or that it was not important should never be overtly or covertly conveyed to the survivor.

As recovery progresses, it is important that women have access to services that can assist them to deal directly with the sexual abuse. The optimal timeframe for this process has not been determined through research. The experience of most women's programs suggests that these issues should not be discussed for a minimum of 6 months to a year after attaining sobriety and, even then, only within certain guidelines, such as active participation in a 12-step recovery program. Evans and Schaefer (1980) make a critical point: Without attention—at some point—to sexual abuse, relapse often occurs.

The critical importance of all-women groups becomes most obvious when addressing sexual abuse issues, but the need for special recovery groups for women extends beyond these issues. Aries (1979) reports some important research that supports the clinical experience of women's programs. Results of her study showed that (1) sex role interaction patterns replicated themselves in mixed groups—i.e., women had minimal contact with other women and allowed men to dominate the groups; (2) women in all-women groups shared a great deal with each other; (3) in mixed groups, men had a more personal orientation than in all-male groups, where men were more concerned with the expression of competition and status. As Deborah Smith Parker (personal communication, 1983), executive director of the California Women's Commission on Alcoholism, aptly summarizes the situation, "In mixed groups, men talk about their problems. The women support the men. The men get better. The women don't."

Although an all-women's approach is important in all phases of women's recovery, it may be fundamental to healing problems related to sexual abuse. Because men are the perpetrators of the vast majority of sexual abuse acts, the overwhelming majority of victims of abuse are women. To mix men and women in any alcoholism recovery group could be perceived by group members as mixing perpetrators and victims. Common sense indicates that this approach simply will not work.

Additional aftercare needs of women include stress-reduction techniques, vocational and career services, legal counseling, instruction in parenting skills, education and information on premenstrual syndrome, child care services, and access to health care services. Because less social support is available to women as compared with men in recovery (Beckman and Amaro 1984), long-term aftercare and emphasis on the development of a sober support network are also crucial factors that providers must consider in program planning for women.

In designing services for women in any phase of recovery, it also is important that providers account for individual differences among women. Women are not a homogeneous group. Although the heterogeneity of women has been seriously neglected by researchers, experience has shown that differences based on race, ethnicity, class, and sexual orientation are important factors to consider in program design.

In summary, the issues that women bring to early sobriety and treatment—low self-esteem, extreme stigmatization, high probability of sexual abuse, lack of social support, and the need for support services such as child care—are the same issues women bring to the aftercare phase of recovery. Addressing these issues in a positive, women-oriented environment that promotes empowerment is essential if the recovering woman is to develop a positive self-image.

Investment in research studies that make use of the accumulated experience of women's recovery programs is needed to integrate our existing knowledge and to identify the most effective services for recovering women. The tasks—and challenges—are to identify, acknowledge, and understand the interplay of the addiction (disease) process, including relapse, and the realities of women's lives. This information must then be applied in the development of treatment philosophy, policy, and programming for women's services. ■

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Techniques for the Recovering Person To Use In Parenting

PATRICIA O'GORMAN, PH.D.
PHILLIP OLIVER-DIAZ, M.S.W.

In the past 20 years, great strides have been made in the field of alcoholism: the disease concept is firmly rooted; treatment is widely available; and the stigma of alcoholism has been chipped away to some degree. Yet only recently has family treatment been seen as a need. Concern for children of alcoholics is a relatively new interest for providers, and little information is available. Parenting seems to be the area least focused upon by the alcoholism professional. This article, adapted from a chapter in *Breaking the Cycle* (O'Gorman and Oliver-Diaz, in press), provides information on parenting issues.

The recovering alcoholic generally walks into the parenting role with major deficits—either being the adult child of an alcoholic or coming from some kind of dysfunctional family (Goodwin and Guze 1974). In addition, the alcoholic has few role models for positive parenting. The basic pitfalls of early recovery, if not addressed, will inhibit healthy parenting.

ISSUES IN RECOVERY FOR THE ALCOHOLIC

During years of active alcoholism, alcoholics have developed distorted beliefs concerning themselves and their families. They believed that it was safer to love alcohol than it was to love people and that there were only two options in life: to be totally out of or totally in control. They believed that people were not to be trusted and that to ask for help was a sign of weakness.

The alcoholic has learned to keep feelings a secret and to expect others to do the same. The world of addicted persons is one of lying, using, and manipulating. Their needs are made the focus of everyone. Thus for children, the first real test of recovery is to see whether alcoholic parents' attitudes have changed.

How Addiction Affects Parenting

Many recovering people have a hard time understanding that just getting sober is not enough. Marie, a 35-year-old recovering alcoholic, has been married for 15 years. She is the mother of a 10-year-old boy, Austin, and a 14-year-old girl, Nancy. Her husband, Jack, has accused her of being as selfish and self-involved now as she was when she was drinking. Her children seem not to trust her, and they resent the time she spends at Alcoholics Anonymous (AA) meetings. All of this is confusing to Marie. She cannot understand why her family does not appreciate how hard she has worked to get sober. What Marie does not understand is that while staying sober, she is still operating under her old alcoholic belief system. Her children observe this. Because they remember her old behavior patterns, they need to perceive meaningful change before trusting her again.

Rule: *Remember, being a recovering alcoholic is only one of many roles, with spouse and parent roles being most important to the family.*

It is quite common for recovering alcoholics to see themselves only in terms of their own problems. Their drinking and recovery, they feel, should be primary to their family. Their identification with recovery is the most significant feature of their lives. Fulfilling the AA program is their primary purpose. In the enthusiasm of finding a new way of life, alcoholics often forget that the Twelve Step program is not separate from life but was designed to be incorporated within it. With recovery, they should become more productive workers, lovers, sons, daughters, husbands, wives, and parents.

To discuss compulsively their progress in combating their "fatal disease" is an error. The family needs to see a spouse or parent, not just a recovering alcoholic. In order for true recovery to take place, the focus in the family should shift from the needs of the alcoholic to the needs of the individual family members.

Rule: *Impart information in an appropriate manner.*

Another error made by recovering alcoholics is to describe inappropriately their disease to their young children. The natural reaction of a child whose parent has gone into remission from a serious illness is to avoid any discussion of the illness once the parent is better. This allows the child to experience a period of safety and security in the knowledge that the parent is better (Klein 1932).

Children of parents with alcoholism are no different from other children. They do not need to hear that alcoholism is a fatal disease from which their parent still suffers and only recovers slightly each day. Young children cannot possibly understand this concept. The alcoholic parent needs to describe alcoholism carefully in an age-appropriate manner. The alcoholic should assess the effects on children of such discussions and the most constructive manner in which to convey necessary information.

Rule: *Own your own feelings and allow children to own theirs.*

In healthy families, adults help children identify their own feelings and they support the children's right to have them (Ginott 1965). This is not easy for the alcoholic person. Feelings are threatening. Alcohol, food, and chemicals have been used to anesthetize emotions. Any expression of them is considered dangerous. Because so many people with alcoholism come from dysfunctional families, they have not learned to identify their own feelings. They, therefore, dismiss feelings they cannot identify. Recovering alcoholics often are learning to understand feelings at the same time that their children are learning to understand their own.

Alcoholics often react negatively to their childrens' emotional expressions because they do not feel adequate to respond. They have no personal experience on which to draw. Too often, their response to the exhibition of strong feelings is to attempt to stop the child's emotional expression, and, thereby, to lower their own level of anxiety.

Children learn to dismiss or hide their feelings so as not to suffer the displeasure of their parents. This is a repeat of the cycle of denial that most alcoholic people went through as children. This cycle breeds resentment and erodes self-esteem. It also sets the stage for the next generation of alcoholism (O'Gorman 1975).

Rule: *Learn to survive feelings.*

The belief of most alcoholic people is that they cannot survive the experience of certain feelings such as anger and sadness. To the degree that alcoholic parents do not deal with these dormant feelings in themselves, they will find ways to avoid dealing with them in their children.

Rule: *Think before you act.*

An impulse is a sudden inclination to act without thought for the consequences (Random House 1983). Most alcoholics have problems with impulse control. They eat or drink on impulse. They marry or take jobs on impulse. During active addiction, a lack of impulse control affects parenting. This results in children from alcoholic households having problems with determining what is right or wrong behavior. The rules keep changing. They learn that consistency is not expected. This breeds potential problems for the children both in school and, later, in the work setting, where rules must be followed and respected (Reiner and Kaufman 1959).

Children of recovering alcoholics often report that among the most frustrating aspects of recovery are the humiliating things their parents do to them. They can never predict what their parents will do next. Security and predictability, two of the most fundamental cornerstones of a healthy childhood, are lacking. The child of the recovering alcoholic is constantly on guard, because the alcoholic is still unpredictable. The children still fear that they will be humiliated by some thoughtless action. The recovering alcoholic must take care to heed this fundamental aspect of parenting.

The other side of impulsive behavior is compulsive behavior. Compulsion is defined as an irresistible urge (Random House 1983). A compulsion is different from an impulse in that it is repetitive, restrictive, and rigid. Compulsions are hard to break, as any alcoholic knows. The compulsion to drink is the first major challenge with which recovering alcoholics are faced. But once this compulsion is overcome, other compulsions must be faced to enable the alcoholic to become a healthy parent. A healthy family is an open family in which there is room for growth and change. If negative compulsive rituals are enforced, the recovering family will feel locked in and hopeless.

Rule: *Progress, not perfection, is the goal.*

Perfectionism is sometimes a major problem for alcoholic people. It interferes with all aspects of their lives but is particularly destructive to healthy parenting. In simplest terms, perfectionism is the constant demand to meet excessive, unattainable standards. Perfectionists always have the gnawing doubt that they are not good enough. They believe that they can win love and acceptance only through performance.

The path to health as a parent is filled with many imperfections. If recovering alcoholic parents approach the task of parenting with perfection as an ideal, they will fail. Admitting imperfection brings with it the opportunity to learn and grow and allows the family to do the same. Everyone needs to make mistakes to learn, especially children. Mistakes should be met with understanding. Goals need to be attainable because it is in successful goal accomplishment that children build self-esteem (Marks 1982). If children are brought up with the message that they are not good enough, they will grow up without the ability to enjoy their accomplishments. The only way to avoid perfectionism in parenting is to learn to be less of a perfectionist with oneself (Arnold 1978).

THE ROLE OF THE TREATMENT AGENCY

The alcoholism treatment professional needs to help clients to accept their limitations and to develop behavioral approaches to overcome perfectionist tendencies. The only way to accomplish this is by incorporating an organized approach to parenting into treatment programs. Sending home a sober parent must no longer be the end point of an alcoholism rehabilitation program.

SUMMARY

Parenting is affected by alcoholism. Recovering alcoholic parents need to be aware of some basic pitfalls. The expression of feelings is one. This is threatening to persons with alcoholism, because they often come from families in which the expression of feelings was forbidden or abused. They have learned to anesthetize their feelings with alcohol, so dealing with the feelings of their children creates anxiety.

Impulsive and compulsive behaviors are other problems. Recovering persons need to examine their behavior and its impact on their spouses and children. The disease concept of alcoholism, itself, can be troublesome to children if not explained in a way they can understand. Recovering alcoholics should be careful not to use AA-specific terms when explaining their disease and not to raise anxiety in their chil-

MYTHS ABOUT RECOVERING FROM ALCOHOLISM

More and more people are recovering from alcoholism and going on to lead healthy and successful lives. Although we know a great deal more about alcoholism than we did 10 years ago, many widely held misconceptions or myths about alcoholics in recovery turn persons with this illness into victims of prejudice as well. Debunking these myths can assist those who have embarked on the recovery process.

Myth. *Alcoholics Anonymous (AA) is a super-secret, religious organization.*
Fact. Members are encouraged not to reveal publicly their own personal affiliation with AA or that of other members, but they can discuss ideas shared in the meetings. Confidentiality is assured to protect recovering persons, but AA is not a secret society.

AA is the most widely available support for an alcoholic who wants to quit drinking. The over 1 million recovering alcoholics worldwide who are members of AA have found that sharing the recovery process with other people holds the best promise for their own continued sobriety. AA is made up of people of every age and from every profession, religion, and race.

AA meetings are held daily all over the world. The "open" meetings welcome nonmembers, but "closed" meetings are restricted to those in recovery. The process for recovery is guided by what is known as the Twelve Steps. With the exception of the common reliance on the Twelve Steps, AA is unstructured and has no rules, regulations, dues, affiliations, or membership cards.

In open AA meetings, anyone with an interest in alcoholism can come and hear speakers relate personal stories, including what their lives were like as drinking alcoholics; what motivated them to stop drinking; and how their lives have changed since quitting. Some meetings close at this point, while others continue with a session in which those attending it share thoughts and feelings triggered by the talk. In closed meetings, a topic is chosen as the focus for a meeting, and alcoholics may either discuss the subject or bring up related concerns.

The primary purpose of all AA meetings is to remind alcoholics that they should not drink. New AA members are encouraged to go to AA meetings as frequently as necessary to avoid drinking. Even members who have some experience with sobriety generally go to several meetings a week.

As part of the Twelve Steps, AA members are urged to renew the spiritual dimensions of their lives. Regardless of whether they are affiliated with a religion or are agnostic or atheistic, members believe that spirituality is the key to a successful, rewarding life. AA is not a religion, but its program makes people aware of the importance of the spirit within them.

Traditionally, AA members protect each others' identity. Of course, each member decides to whom to reveal his or her own involvement. Many people would not attend a meeting if anonymity were not guaranteed.

Myth. *All recovering alcoholics "hit rock bottom" before they finally quit drinking.*

Fact. Most recovering alcoholics have experienced a major life disruption such as a divorce, an automobile accident, or unemployment; but they do not necessarily become completely demoralized before they stop drinking, though they have all recognized that eventually they would hit bottom if they continued to drink. Recovering alcoholics regard alcoholism as a life-and-death matter.

Myth. *Once an alcoholic, always an alcoholic.*

Fact. A distinction should be made between a *practicing* alcoholic and a *recovering* alcoholic. Alcoholism is a disease in which individuals lose control over alcohol to the point where drinking interferes with relationships and/or job performance, in spite of which they continue to drink. A variety of factors seem to play a role in alcoholism—genetic predisposition, family background, personality, social environment, and—of course—alcohol use. The exact cause is unknown. The alcoholic may have begun as a social drinker, but the alcoholic's system became progressively tolerant of and dependent upon alcohol. The alcoholic may want to quit drinking but usually is unable to stop drinking permanently without help. Although recovery is a lifelong process, an alcoholic who receives treatment and maintains sobriety can lead a happy, productive, and rewarding life.

dren or make them feel insecure. Identity as an alcoholic can become a barrier if it is the most important identity a parent has. The role as parent is as significant to the family as the role of recovering alcoholic is to the alcoholic.

Progress, not perfection, is the alcoholic's goal. Parenting training must be incorporated into alcoholism rehabilitation. The healthy parent or family is one that allows family members to learn from their mistakes. Healthy parents increase self-esteem in their children and offer a safe and secure environment. With self-awareness and discipline, recovering alcoholics can be healthy parents. ■

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Myth. *Recovering alcoholics are essentially weak people who succumbed to the bottle and will easily succumb to other temptations.*
Fact. Research has not succeeded in defining a so-called "alcoholic personality." Studies of the social characteristics of alcoholics have not consistently shown that they differ remarkably from persons without alcohol problems. There is no reason, therefore, to believe that they are any more prone to succumb to other forms of temptation than other persons.

Myth. *A recovering alcoholic who gets depressed, angry, stressed, or frustrated will begin drinking again.*
Fact. Relapses do occur for many recovering alcoholics. In fact, some experts believe that one relapse is a necessary phase of recovery for some alcoholics—one last experience to convince the alcoholic that safe drinking is no longer possible.

While one or more relapses are a very real possibility, especially during early recovery, relapses are not inevitable and tend to grow less common as recovery progresses. Just as those who suffer from heart disease, diabetes, or epilepsy must stay alert to warning signs, recovering alcoholics and those who care about them must learn to recognize and deal with factors that may precipitate relapse. Proper action by recovering alcoholics and the key people in their lives can prevent relapse before the alcoholic's ability to function at home or on the job is impaired.

It is important to watch for warning signs that indicate that a recovering alcoholic may be headed for another drink. For instance, recovering alcoholics who convince themselves that alcoholism is no longer important or who revert to old behavior patterns may be about to relapse.

Participation in AA meetings and other forms of aftercare is essential for many recovering alcoholics, especially those without a supportive home or work environment.

Myth. *Families in which the mother or father was, or still is, alcoholic will beget alcoholic children.*
Fact. Actually, most children of alcoholics do not become alcoholics. They simply run a higher *risk* of the disease than children with nonalcoholic parents. However, a child borne by an alcoholic woman may suffer from fetal alcohol syndrome or other alcohol-related birth defects caused by the alcohol consumed during pregnancy.

Uncontrolled drinking on the part of either parent also may lead to a pattern of emotional problems in the children that can adversely affect their lives if not recognized and treated. The recovery of the alcoholic parent is, of course, vital to the emotional and physical well-being of all family members.

Myth. *It is dangerous to drink in the presence of a recovering alcoholic. Doing so may trigger within the alcoholic an uncontrollable desire to drink.*
Fact. Recovering alcoholics are not always dying for a drink. A survey of AA members revealed that the reported average length of abstinence was 3 years and 9 months. Obviously, during that time alcohol had been accessible either at social events or from the neighborhood liquor store. As recovery progresses, the desire to drink occurs at increasingly less frequent intervals. Although it may be polite to ask if the recovering alcoholic has any objections to alcohol being used, it is not always necessary.

Myth. *Recovering alcoholics have a tendency to be self-centered and to dwell on their alcoholic past.*
Fact. Unfortunately, some recovering alcoholics appear to think they are the only people in the world who have gone through a traumatic experience. For most, however, recovery was a humbling experience that increased their sensitivity toward the vulnerabilities of others. If you are uncomfortable with the recovering alcoholic's demeanor, make it known in a caring way. Like other interpersonal differences, it will be worked out if the relationship is important enough.

Myth. *Recovering alcoholics are high-risk employees who must be carefully monitored.*
Fact. Many recovering alcoholics make excellent employees. Like everyone else, they deserve to be judged on their real merits and performance. Some recovering alcoholics were able to maintain a stable job that they performed well even during the time they were drinking. In other cases, alcoholism may have seriously affected their job performance and, perhaps, may have caused the job loss. The process of recovery can restore an individual's capacity to be a productive employee. As the period of sobriety lengthens, impairments are reversed; but during early recovery it may be important for an employer to make sure that appropriate treatment and followup care are being received.

—*LAURA RONAN*

Reversal of Alcohol Effects

Acute and Chronic Conditions

DOROTHY T. MOORE, PH.D.

It should surprise no one to learn that alcoholism is the third largest public health problem in the United States, being outranked only by heart disease and cancer, and that it reduces life expectancy by about 12 years (West et al. 1984). Even the proverbial man in the street knows that alcohol abuse exacts a high price from the liver and other organs of the body. Since the early 1970s, when public, professional, and private organizations began to redouble their efforts to curb the abuse of alcohol and other drugs, messages describing the associated health risks have increased in number and variety. At the same time, more and more people have been reading and hearing about the costs—medical, social, and economic—of alcohol dependence.

Fortunately, this information explosion has an encouraging aspect for those who want to do something positive about the risks and the costs. Scattered throughout the mounting literature on damaging consequences of alcohol abuse are references to full or partial recovery from some of its adverse effects.

Not all of the damaging effects of alcohol are reversible, of course. Which ones are? And when? Just how reversible are they? And what is done to reverse them? In research findings, both clinical and experimental, we find some answers to these questions.

ALCOHOL: A CASE OF MULTIPLE IDENTITY

Understanding the effects themselves, as well as the reversals, will depend crucially on understanding the role of ethanol, the ingredient that defines a beverage as alcoholic. Immediately the plot thickens, because ethanol plays several roles, through a succession of chemical changes, as it undergoes the process of metabolism. Furthermore, as an agent for damage, ethanol or one of its metabolites can act either directly or indirectly—or both—on cells of the liver and other organs. In addition, as a substance originating outside the body, beverage alcohol contains other substances (natural congeners as well as additives) that produce their own physiological effects. Finally, it would be naive—indeed, often dangerous—to ignore the fact that alcohol consumption is frequently accompanied by exposure to other toxic substances in the environment or by self-administration of other drugs that interact with ethanol, thereby changing the way the body is affected.

Ethanol Metabolism. Let's begin with some key events in the metabolism of ethanol. The first step, of course, is consumption of an alcoholic drink. A small proportion (less than 10 percent) of the ethanol in the drink will be excreted via breath, sweat, and urine (Badawy 1984; Mezey 1985/86). The remaining 90-or-so percent will be converted to other substances, mainly in the liver.

Here, three enzyme systems are available to metabolize the ethanol by oxidizing it to acetaldehyde. In the most important of these systems, alcohol dehydrogenase (ADH) serves as the principal enzyme, assisted by nicotinamide adenosine dinucleotide (NAD) acting as a coenzyme.

Figure 1*a* is intended to show schematically that NAD participates in the conversion of ethanol to acetaldehyde. It then dissociates from ADH. Meanwhile, NAD has picked up a hydrogen ion (H). This chemical reduction of NAD to NADH shifts the redox (oxidation-reduction) balance in the liver toward reduction. Restoring the redox balance requires production of more NAD, partly by stripping NADH of its hydrogen ion, thus oxidizing it. But the ongoing oxidation of ethanol interferes with this process.

In her discussion of ethanol metabolism, Goldstein (1983) observes, "The wholesale conversion of NAD to NADH during ethanol oxidation overwhelms the liver" (p. 10). One destructive consequence is interference with the final oxidation of foodstuffs—fats, carbohydrates, and proteins—by slowing the Krebs cycle, a series of biochemical reactions that yield carbon dioxide, water, and energy.

Recovery from acute intoxication could theoretically be aided by speeding up the oxidation of ethanol, though such a process is impractical. Fructose does this, partly by helping to restore the redox balance in the liver. However, as Goldstein points out, effective doses of the sobering-up agent would need to be about as large as the doses of ethanol. In an emergency situation, Goldstein concludes, "A teaspoon of honey will not help at all" (p. 11). Furthermore, Badawy (1980) informs us that under these conditions, fructose produces unpleasant side effects.

Even if ingestion of fructose did significantly speed up the elimination of ethanol, another problem would be created: a rapid buildup of acetaldehyde (see Figure 1*a*). For a beneficial outcome, this highly toxic metabolite of ethanol would then have to be changed at lightning speed to its own metabolite of ethanol, acetate. This is a Catch 22 situation because the conversion of acetaldehyde to acetate also entails the reduction of NAD to NADH.

Presumably, some ingested alcohol is metabolized by enzymes other than ADH. When ethanol is chronically administered to experimental animals, as much as 30 percent of the ethanol-oxidizing activity is performed via a non-ADH pathway (Matsuzaki et al. 1981). For human beings, the quantitative proportion is not definitely known.

Of the other two systems available in the liver, the one using catalase as the principal enzyme is responsible for metabolizing only about 2 percent of the ethanol present in the liver (Badawy 1980). The prime candidate, then, for an effective non-ADH pathway is the microcosmal ethanol-oxidizing system (MEOS).

It is known that MEOS activity is increased under conditions of chronic alcohol consumption (Lieber and DeCarli 1968). It is known also that high levels of alcohol consumption result in faster clearance of ethanol from the bloodstream (Salaspuro and Lieber 1978). These two observations, taken together, suggest that the MEOS system may act primarily when the load is too great for ADH alone.

If MEOS does metabolize alcohol primarily under conditions of chronic—possibly heavy—consumption this may help to explain why chronic ingestion of alcohol has effects that differ in some respects from those following acute ingestion. For example, a dose of alcohol reliably increases oxygen consumption, but this increase is greater in alcoholics than in normal individuals (Pirola and Lieber 1972).

Direct or Indirect effect? Considering the important changes in liver function that are caused by ethanol metabolism, it is obvious that functions of other organs will be affected as well. The indirect effects, as will be seen in considering nutritional deficits, can range from night blindness to sexual dysfunction, both related to the disruption of vitamin A metabolism in the liver (Bonjour 1981).

The liver itself is subject not only to direct damage by ethanol and its metabolism (Lieber and Leo 1982) but also, probably, to indirect damage associated with malnutrition (Badawy 1985).

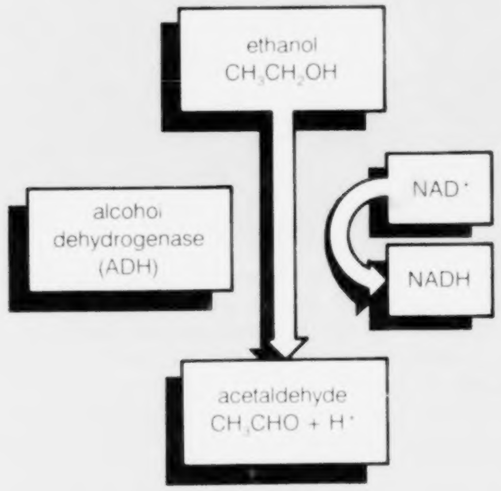
Of prime importance in every case—whether we are talking about fetal alcohol syndrome, about male impotence, or about brain damage in adult alcoholics—is the question of whether the alcohol-related damage is direct or indirect. Because the physiological effects of alcohol are so varied, proponents of one school of thought argue that many of these effects depend on the disturbance of structure and function in cell membranes. This is initiated by simple mechanical forces, as explained by Goldstein (1983):

> *[Ethanol's] structural simplicity makes it a feeble agent indeed . . . Its inertness at low concentrations allows its presence in the body to be raised to higher and higher levels, until the simple bulk of it, forced into cell membranes by the pressure of a high aqueous concentration, disrupts the functions of cells . . . One theory of the action of ethanol ascribes many of its primary effects, especially in the brain, to this disordering of membrane structure. (p. v.)*

These issues are relevant to recovery strategies, particularly where reversals are concerned. If, for example, the damage in question is related to malnutrition, the plan for recovery must take into account specific connections between malnutrition and the influence of alcohol. In one case, the high caloric content of alcohol may have had a depressing effect on appetite, thus setting the stage for inadequate eating habits. Systematic improvements in one's diet can then lead to improvement in health. In other cases, however, chronic abuse of alcohol can disturb nutrition indirectly, through relatively direct lesions in bodily organs such as the liver or the intestines. If vitamin A metabolism in the liver is disturbed, extra vitamin A in the diet can do more harm than good (Lieber 1984). If calcium absorption in the intestines is inhibited, a calcium supplement will be wasted and will not reduce the alcoholic's risk of developing osteoporosis (Spencer and Kramer 1986). In either case, the first step toward reversal of the nutritional defect is to stop abusing alcohol.

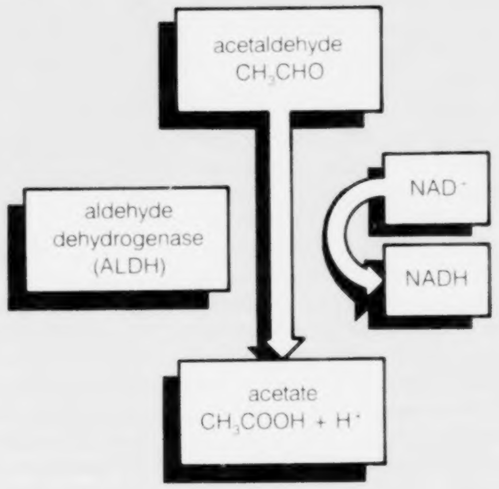
Accomplices. As noted earlier, effects of alcoholic drinks are not limited to the action of ethanol itself. Natural congeners derived from the foods—usually grains or fruits—used in producing beverage alcohol may be neutral or even potentially medicinal in

Figure 1a. **ADH metabolism of ethanol, stage 1.**



Source: Adapted from Badawy 1984.

Figure 1b. **Metabolism of acetaldehyde in the liver (stage 2 of ethanol metabolism by ADH).**



Source: Adapted from Badawy 1984.

effect, as in the case of tannic acid in some wines. Under conditions of medical use, these are no more to be feared than theophylline, a potentially therapeutic agent that we ingest with our tea.

Other congeners may have a less benign influence depending on individual circumstances. One such case is an estrogenic substance found in bourbon whiskey. It has been shown in animal studies that a bourbon extract binds chemically to estrogen receptors in uterine tissue (Eagon et al. 1986). Gavaler and her colleagues (1986) propose that such estrogenic substances, when they occur in alcoholic beverages, may enhance the feminization seen in some alcoholic men with cirrhosis of the liver. Under these circumstances, efforts to reverse the detrimental effects of alcohol abuse would depend not only on avoidance of ethanol itself but also on avoidance of the alcohol congeners that introduce a female hormone into the body.

Serious negative consequences can be expected of other congeners and adulterants added, intentionally or not, to beverage alcohol. An unusual example is the palm oil-based alcohol made on the Ivory Coast of Africa, where the toxicity of the drink is made worse by storage in old, rusty tin cans or old oil cans (Paille and Barrucand 1984).

Even more serious is the fact that beverage alcohol in various forms can contain cancer-causing agents, or the ethanol itself may promote the development of cancer through interaction with other agents or through direct action on the target organ (Lieber et al. 1986; Prugh 1986).

With regard to cancer risks or related symptoms, two important points to bear in mind are that (1) the diagnosis depends considerably on sophisticated knowledge of the roles played by congeners and additives in alcoholic drinks and (2) the course of treatment depends heavily on accurate information about the kinds and the quantities of alcoholic beverages the patient consumes.

Interactions. Two methods of chemical exposure render alcohol consumers more vulnerable than nondrinkers. These act as crucial variables affecting the impact of ethanol on the body.

One class of such chemicals is environmental. This is a particularly important set of hazards encountered in the workplace, although they are not restricted to this context. A well-known example is carbon tetrachloride (CCl_4), a liver poison that interacts with alcohol to produce morbid—or even fatal—liver disease.

According to Merck (1976), the uses for CCl_4 include fire extinguisher; cleaner for clothing; agent for drying spark plugs; solvent for oils, fats, lacquers, varnishes, rubber waxes, and resins; oil extractor for seeds and flowers; insect exterminator; and starting material for the manufacture of organic compounds. When the atmospheric concentration of CCl_4 is high, inhaling it is sufficient to cause damage, especially if it interacts with alcohol in the body. The risk of liver poisoning is much higher, of course, when CCl_4 is used to kill intestinal worms, a use which may have little practical importance in the U.S. (See Zimmerman 1986 for a review.)

Coping with such environmental toxins is more a matter of prevention than of recovery or reversal. Needless to say, even a nonalcoholic is at risk when exposed to these substances; but the risks are magnified by alcohol.

Drugs form the other class of agents that are mutually destructive with alcohol. These range from illicit street drugs such as cocaine and marijuana to prescription and over-the-counter medicinal preparations. The consequences of combining alcohol intake with another drug range from subtle psychological change to devastating organic lesions, depending on a variety of factors. These factors include individual differences in vulnerability, but some general principles can be stated.

Chronic abuse of alcohol reliably produces some degree of tolerance, so that the desired effects of a drink are reduced. Cross-tolerance to other drugs is one result. To the alcohol-abusing patient who proves to be cross-tolerant to a pain-killing drug, the effect is uncomfortable. To the physician aware that this situation increases the likelihood of an overdose, the effect is dangerous. For self-protection, it is essential for the patient to provide an accurate description of his or her drinking habits. Better still, the patient anticipating a painful challenge, such as surgery, would do well to abstain from drinking for several weeks in advance.

If the pain-killing drug is acetaminophen (ACM), damage to the liver can be life-threatening, particularly if the physician recommending it is unaware that the patient is or has been a heavy drinker. By itself, ACM was identified as a liver toxin as long ago as 1966. In recent years, interactive effects of combining this drug with alcohol have stimulated much research, both clinical and experimental. Apparently, acute intake of alcohol prior to ACM administered to laboratory animals is protective; but clinical and experimental reports suggest that chronic alcohol intake increases organic susceptibility to ACM toxicity. (See Zimmerman 1986 for a review.)

From the above discussions, it should not be inferred that the interactions between ethanol and other substances are *invariably* more destructive than either agent alone. Goldstein (1983) explains two situations in which ethanol serves as an antidote. In one of these, the poison is methanol (wood alcohol). Its capacity for blinding the drinker is traced to the fact that it metabolizes to formaldehyde, a retinal toxin. Ethanol inhibits the metabolism of methanol, thus enabling it to be excreted via breath and urine, by competing for utilization of both ADH and catalase.

The other antidote situation applies to ingestion of ethylene glycol. When this substance is metabolized, it produces oxalic acid, which poisons the kidneys. Again, ethanol serves as a competitor for metabolism via the ADH pathway.

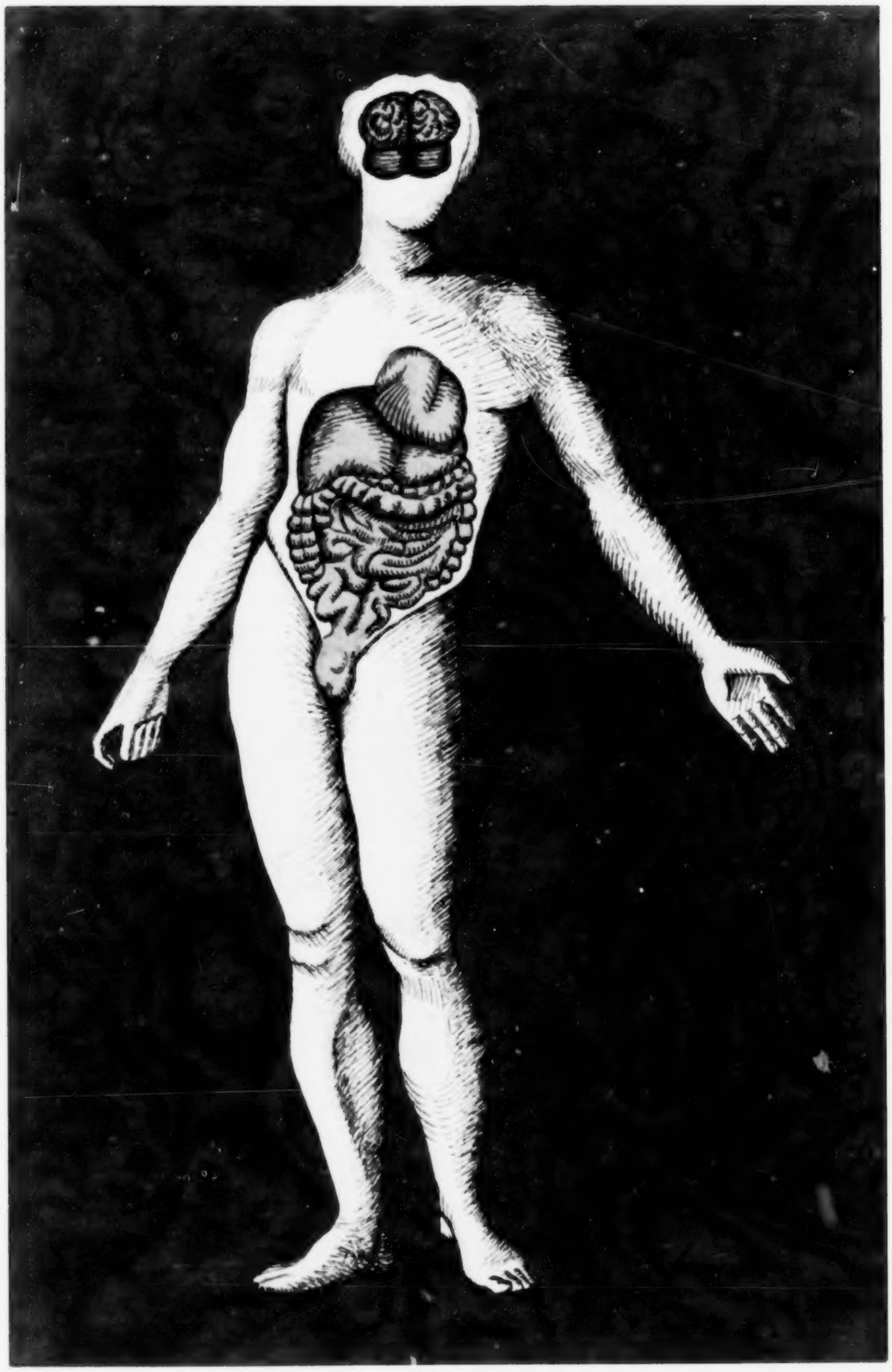
Ethanol should not be counted on to perform miracles, however. This was demonstrated when lethal levels of methanol, which proved fatal to at least 20 people, were found in some Italian wines ("For the record" 1986; "Poison plonk" 1986).

ORGANS AND FUNCTIONS

Some major alcohol-related effects that can be reversed are reviewed here in the context of organ systems. From the research literature to date, there emerge hopeful indications for improvement of function in the brain (central nervous system) and in the liver. Brief mention will also be made of beneficial effects of alcohol abstinence on the heart, the blood, skeletal muscles, and the gastrointestinal system. Specific remedies will be discussed sparingly, because unforeseen changes occur in the field of medicine. A physician should be consulted, anyway, for diagnosis and for individual treatment.

Brain Function. Some of the most dreaded effects of organic dysfunctions caused by ethanol are those that manifest themselves in syndromes known as alcoholic dementia, Korsakoff's syndrome (sometimes called Korsakoff's psychosis), and Wernicke's encephalopathy. In recent commentaries, the latter two are combined, with the authors viewing Wernicke's as the early stage of a syndrome that changes to Korsakoff's when the condition is chronic (Butters 1982; Greenberg and Diamond 1985; Nakada and Knight 1984; Ryan and Butters 1983).

Descriptions of Wernicke's encephalopathy generally highlight mental confusion, disorders of gaze, some form of ataxia (because of damage to the cerebellum, which coordinates brain control of move-



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ment through space), and impaired memory. Other symptoms commonly include liver disease, high blood pressure, skin disorders, and lesions of mucous membranes. For some untreated patients in the acute phase of Wernicke's encephalopathy, the mental confusion may progress to a state of coma.

The Korskakoff stage of the syndrome seems less life-threatening, superficially, but this is recognized in the current literature as the chronic illness. Mental confusion appears to lift, although the patient is sometimes disoriented in time and place. The most outstanding clinical feature is a memory disturbance. To the casual observer, this is apparent because the patient may repeat, within a few minutes, the same anecdote. Short-term memory is obviously impaired, and new information fails to register. In some cases, memory for long-past events is impaired as well. This may explain why confabulation—i.e., accounts of events that have not actually occurred—is sometimes evident.

In the case of brain damage, this question is especially relevant: Does ethanol (or one of its metabolites) poison brain cells directly, or is the damage caused by malnutrition? The answer is not clear (Harper 1982; Tarter and Ryan 1983; Wasterlain et al. 1983). However, there is strong evidence that Korsakoff's syndrome and Wernicke's encephalopathy are malnutrition-related disorders (Nakada and Knight 1984). In fact, the symptoms of Wernicke's encephalopathy, though most frequently coexisting with alcoholism, have been associated with malnutrition in other clinical conditions.

Especially in the case of Wernicke's encephalopathy, administration of large amounts of vitamin B_1 (thiamine) has sometimes produced remarkable recovery. (Because intestinal absorption of the vitamin is usually impaired in alcoholic patients, however, oral doses are not effective.) In a large, long-term, study cited by Greenberg and Diamond (1985), acute mental confusion and some aspects of gaze disorders were resolved within days to weeks. As treatment continued, about 40 percent of the recovering patients regained normal control of eye gaze and steady gait.

It has been suggested that when recovery is not complete after alcohol abstinence combined with thiamine therapy, the Wernicke's encephalopathy patient may be predisposed, genetically or by lifestyle, to contributing factors other than alcohol. Included is thiamine malabsorption (Nakada and Knight; 1984; Tarter and Ryan 1983). However, highly vulnerable areas of the nervous system may have reached an irreversible stage of damage, thus nullifying attempts that have begun too late.

Only in recent years have clinicians reported that thiamine therapy, if begun early enough and if combined with complete abstinence from alcohol, results in some recovery of function in patients with Korsakoff's syndrome, which was once thought to be totally irreversible (Carlen 1982; Cutting 1978). However, recovery of memory function is slowly achieved and is incomplete in the majority of these patients (Nakada and Knight 1984). Under experimental conditions, treatment of Korsakoff's syndrome with clonidine (a drug that stimulates the activity of norepinephrine in the CNS) enhances memory (McEntee and Mair 1980*a*, 1980*b*). This suggests that the memory deficit is associated with damage to nerve cells that use norepinephrine as a neurotransmitter. However, the pattern of brain damage after long-term alcohol abuse is not yet explained and the evidence on neurotransmitters is indirect.

Patients diagnosed as having alcoholic dementia have symptoms similar to the cognitive disorders and the disorientation of Alzheimer's disease (USDHHS 1983). However, the dementia associated with alcohol is potentially reversible, if the patient abstains from drinking (Cutting 1978; Ron et al. 1982). Nakada and Knight (1984) suggest that the dementia symptoms, like those of Wernicke's encephalopathy, may be related to thiamine and other nutritional deficiencies. In fact, they consider it possible that alcoholic dementia may be a form of Wernicke's encephalopathy.

For any of the alcoholic brain disorders, the problem of diagnosis is perhaps more urgent than the problem of treatment. It is generally agreed that they are underdiagnosed (Harper 1979, Torvic et al. 1982). Many cases have been identified at autopsy, after the patients had succumbed to other diseases or disorders. The post mortem diagnosis is usually based on finding that particular areas of the brain appear to have atrophied.

The development of new diagnostic techniques has been accompanied by a flurry of activity to make use of them for detection of brain atrophy. Computerized axial tomography (CAT), or simply computerized tomography (CT), has been the preferred method in alcohol-related studies (Ron et al. 1982). It has been hoped that early identification of tissue loss would lead to effective intervention before alcohol use would do more damage. CT-aided diagnosis is beset with problems of interpretation, however, and the results are debatable (Byrne 1982; Cala and Mastaglia 1981*a*, 1981*b*; O'Hagan 1983; Wilkinson 1982). It is always possible to find evidence of atrophic areas in CT scans of some nonalcoholics. The search for more definitive techniques continues. Positron emission tomography (PET), which shows functional characteristics rather than structural features, may prove to be the technique of choice in the future (Phelps and Mazziotta 1985).

It is now known that Alzheimer's disease patients have brain lesions of a specific type and, probably, in localized areas. Victims of this disease were once called "senile," when it was thought that their symptoms were caused by aging of brain tissue. Allied with the senility assumption is a hypothesis that alcohol causes premature aging and, thus, dementia-like symptoms that resemble senility. If this were the case, there would be little point in looking for reversible brain damage. The brain would be irretrievably atrophied, because it was thought that regeneration could never occur in the central nervous system (CNS).

(Brain research with nonhuman animals paved the way to discovering that the CNS has ways to compensate for some losses or to accomplish some recovery of function. This remains an active area of neuroscience research.)

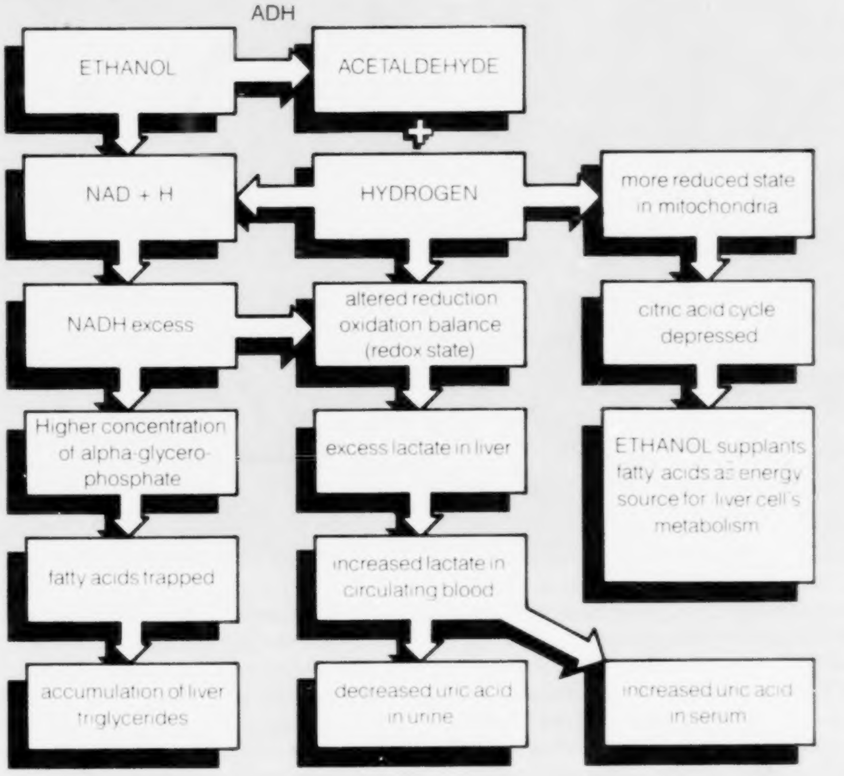
The hypothesis of premature aging has generated some research, but the findings tend to show that alcohol effects cannot be labeled as "aging" (Ryan 1982). In fact, Porjesz and Begleiter (1982) have reported that aging and alcoholism are associated with different patterns of brain electrical activity. A different viewpoint has been advanced by Freund (1982), who emphasizes interactions between aging processes and the physiological effects of ethanol. This approach may make it possible to disentangle the conflicting data.

Parsons and Leber (1982) have provided critiques of studies directed toward the reversibility of alcohol-related brain dysfunctions, particularly in the area of cognition. They discuss the difficult methodological problems involved in trying to design such research, and they see an urgent need for sophisticated studies with long-term followup. Methodological problems have also engaged the attention of Hill (1983), who discusses them from the viewpoint of policymaking in the public health approach to prevention and treatment of alcohol-related brain damage.

Liver function. It is widely known that a possible consequence of chronic alcohol abuse is cirrhosis of the liver, an irreversible disease. Many people are not aware, however, that liver malfunction (a) is a common result of alcohol consumption and (b) is reversible in its early stages. (For comprehensive reviews, see Goldstein 1983, pp. 32–47; Lieber 1984; Lieber and Leo 1982; Mezey 1981; NIAAA 1983; Pimstone and French 1984; Sabesin 1982; and Selmair and Thaler 1980).

The earliest overt sign of liver damage resulting from alcohol use is the alcoholic fatty liver (steatosis). According to Lieber (1984), the exact mechanism by which

Fig. 2. **Process by which ethanol causes excess fatty acids to accumulate in liver cells.**


ADH
ETHANOL
ACETALDEHYDE
NAD + H
HYDROGEN
more reduced state in mitochondria
NADH excess
altered reduction oxidation balance (redox state)
citric acid cycle depressed
Higher concentration of alpha-glycero-phosphate
excess lactate in liver
ETHANOL supplants fatty acids as energy source for liver cell's metabolism
fatty acids trapped
increased lactate in circulating blood
accumulation of liver triglycerides
decreased uric acid in urine
increased uric acid in serum

ADH = alcohol dehydrogenase;
NAD = nicotinamide adenine dinucleotide;
NADH = reduced NAD
Based on Lieber 1984, pp. 3-5

extracellular fat appears in the liver is not certain. Inside the liver cells that are affected by ethanol, examination discloses that fatty acids are present in excess because of the actions of ethanol and its primary metabolite, acetaldehyde. Lieber explains that these fatty acids may result from deposition of dietary fat or of fatty acids synthesized within the body (i.e., endogenous fatty acids). Ethanol has supplanted them as an energy source, thus preventing their oxidation. The probable sequence of reactions is, roughly, as shown in Fig. 2.

Accumulation of lipids in the alcoholic liver is attributed by Lieber to, primarily, increases in the formation of lipids in the liver, mobilization of peripheral fat, and uptake of circulating lipids. These actions combine with decreases in the oxidation of hepatic lipids and in the release of lipoproteins from the liver.

If these physiological events continue, as in chronic alcohol abuse, the next stage of alcoholic liver disease is alcoholic hepatitis, which causes lesions that set the stage for cirrhosis of the liver. Not every alcoholic is destined to develop this most malignant form of liver disease, but the exact proportion who will do so is uncertain. As in the case of alcohol-related brain damage, alcoholic liver disease is under-diagnosed. The clinical symptoms are preceded by organic changes, and even when there are clinical manifestations, they can be mistakenly attributed to other disorders (Lieber and Leo 1982). In addition, not all cases of liver cirrhosis are caused by alcohol abuse (USDHHS 1983).

There is ample evidence, however, that the alcoholic fatty liver condition, which develops rapidly as a result of alcohol abuse, will disappear in 3 to 6 weeks if appropriately treated (Lieber 1984, 1985; Mezey 1983; Pimstone and French 1980; Selmair and Thaler 1980). According to Lieber (1985), uncomplicated alcoholic steatosis can be completely reversed with no treatment other than alcohol withdrawal accompanied by a diet with sufficient energy, vitamins, and protein. Needless to say, a coexisting problem—for example, obesity or severe malnutrition—can delay recovery.

In order to reverse any of the organic consequences of alcohol abuse, early diagnosis and treatment are usually necessary. Where the liver is concerned, the course of the uninterrupted disease process is well known. After fatty liver, alcoholic hepatitis can develop. Treatment for this stage of liver disease is generally the same as for fatty liver. Survival of the patient, according to Lieber (1985) is "dramatically improved" by discontinuation or reduction of alcohol consumption. In this connection, he cites studies showing that the 7-year survival rate is 50 percent when drinking continues, as compared with 80 percent when drinking is reduced.

For patients whose disease has progressed to cirrhosis, alcohol abstinence plays an essential role (Lieber 1985). Although cirrhosis itself is not reversible, clinicians continue therapeutic efforts to alleviate complications. Encephalopathy, for example, can sometimes be relieved by nutritional therapy (Lieber 1985).

In considering the liver damage caused by alcohol, it is important to remember that the effects extend beyond the liver itself. For example, liver malfunction is implicated in the brain syndromes discussed here. Mezey (1981) has also focused attention on the diseased liver's altered responses to the other drugs—medicinal or otherwise. In a recent theoretical attempt to integrate the manifold effects of alcoholic liver disease, Goldstein (1983) describes the consequences as a state of hypermetabolism. This directly suggests that thyroid activity should be reduced therapeutically. However, Szilagyi and colleagues (1983) have cautioned that more research is needed on this subject.

Heart. After reviewing the literature, Halawa (1981) concluded that alcohol consumed in quantities of 60 to 150 mL daily for 1 year can induce damage to the heart muscle. A common effect is enlargement of the heart. Most cardiologists attribute alcoholic cardiomyopathy (alcoholic heart disease) to direct toxic effects of ethanol or its metabolites (Klatsky 1982; Regan and Haider 1981; Segel et al. 1984), although disorders in other systems do contribute to pathological developments in the cardiovascular system.

An important aspect of these effects is that they are interactive. The human heart does not contain the ethanol-oxidizing capacity of the liver, but the acetaldehyde produced by ethanol oxidation in the liver indirectly inhibits protein synthesis in cardiac muscle (Bing 1982). Cardiac triglycerides accumulate (Nordmann 1984). Because the heart is a muscle, maintaining normal calcium balance and calcium binding are essential for normal function; but alcohol interferes with calcium absorption through cell membranes (Allen 1982), and calcium binding in the heart is inhibited (Bing 1982).

None of these indirect effects is sufficient to explain alcohol-related damage to the heart, however. Following a search for other metabolic processes, a breakthrough was reported in 1986 by Laposata and Lange, who had identified non-oxidative ethanol metabolism in many human organs. Here, instead of acetaldehyde, the principal metabolites are fatty acid ethyl esters.

Moderate drinking—but not chronic alcoholism—has been said to reduce the risk of coronary disease, which is related to the risk of developing atherosclerosis. Kane (1981) has reviewed studies relevant to this hypothesis. Some authors (e.g., Klatsky 1982; Sabesin 1981) argue that the elevated circulating level of high density lipoprotein (HDLP) cholesterol in the blood, caused by moderate intake of alcohol, is a persuasive reason to avoid both chronic alcohol abuse and total abstention from alcohol. However, Segel and coauthors (1984) state emphatically that "cessation of alcohol ingestion" must be stressed for any patient with alcoholic heart disease. Thus far, no one can promise that such a temperate approach will reverse severe cardiac damage. Prevention of alcohol-related heart disease is, of course, most desirable. Longitudinal data suggest that teetotalers, especially those who have never smoked, have the lowest coronary heart disease mortality of all (Klatsky et al. 1981).

Blood. In their review of alcohol effects, Larkin and Watson-Williams (1984) identify abnormal enlargement of red blood cells as the predominant blood disorder when alcoholism is not complicated by "marked" liver disease or by folic acid deficiency. This condition is one of the causes of the anemia that afflicts 7 to 19 percent of such alcoholics (Heidemann and Waller 1983*a*).

Other types of anemia discussed in the literature are those caused by (1) reduced bone marrow production of normal red blood cells (erythrocytes); (2) the folic acid deficiency that results from an inadequate diet and/or impaired intestinal absorption of folate; and (3) a deranged iron metabolism. A hemolytic anemia especially associated with fatty liver and linked with periods of heavy drinking is marked by the breakdown of erythrocytes (Larkin and Watson-Williams 1984), from which hemoglobin leaks into the blood serum. Heidemann and Waller report that increased serum iron is found in 40 to 80 percent of alcoholics without liver cirrhosis who are not also malnourished.

In addition to cessation of drinking, treatment of alcoholic anemia with phosphorus compounds is recommended by Al'pidovskiy (1982) when the alcoholism has caused the phosphate balance to be reduced. Reversal of any anemia associated with alcohol abuse depends on the specific effect that has caused it. Sideroblastic anemia, marked by abnormal immature erythrocytes in the bone marrow, disappears rapidly after cessation of drinking except when it is a genetically determined disorder (Bottomley 1982). Heidemann and Waller (1983*c*) make a general statement to the effect that alcohol-induced changes in the development of blood cells can be reversed by eliminating alcohol consumption.

In their review of blood disorders, Heidemann and Waller (1983*b*) link alcoholism with immune system deficiencies as well. White blood cells and blood platelets are vulnerable to the toxic effects of alcohol ingestion, independently of liver disease and of folic acid deficiency. Thus, the immune system is inefficient in the alcoholic, who is abnormally susceptible to infections. (For more details, see Bomalaski and Phair 1982; Fitzharris 1982.) These problems may be reversible if the individual abstains from drinking.

Because ethanol has a direct toxic effect on blood components, it is of interest to know whether there is a practical way to decrease blood alcohol concentration. After reviewing the effects of other drugs in this context, Schutz (1983) concluded that, at present, there is no effective method for reducing blood alcohol levels by administering a drug.

Skeletal muscles. Damage to skeletal muscles is an alcohol-related risk that has not attracted much popular attention (USDHHS 1983), but *alcoholic myopathy* can be severe enough to threaten the survival of the chronic alcoholic. In their review of the related literature, Haller and Knochel (1984) point out that atrophy of shoulder and hip girdles develops insidiously and is often combined with liver disease and/or neurological syndromes. In addition, chronic alcoholic myopathy is often complicated by nutritional deficiencies. Most of these patients also suffer from peripheral neuropathy, i.e., disorders affecting the nerves that control skeletal muscle functions. In fact, the disease may sometimes originate in nerve cells rather than in muscle fibers (Faris and Reyes 1971).

In most of the alcoholic patients, symptoms of muscle weakness are gradually relieved by sustained abstinence from alcohol (Grau Junyent and Urbano-Marquez 1983; Hudgson 1984). Atrophy of Type II muscle fibers (fast-acting fibers that fatigue rapidly) can also be reversed; but this restorative process may take several months of abstinence (Martin et al. 1982). If the patient is also suffering from nutritional deficiency or neuropathy, nutritional supplements including specific B vitamins are required (Haller and Knochel 1984).

Gastrointestinal function. As has been noted above, malnutrition is a common consequence of alcohol abuse. One simple cause for this is an inadequate diet. More complex causes are associated with damage to the gastrointestinal tract. Much research on both human patients and nonhuman animals has been devoted to trying to identify the effects that are specific to alcohol ingestion, i.e., the effects attributable primarily to the tissue-poisoning action of ethanol or secondarily to nutritional problems that result from such tissue damage.

For example, alcoholic hepatitis can result from inadequate biological conversion of foodstuffs to forms that the body can use as nutrients; and alcohol-related brain damage is clearly associated with vitamin deficiencies (Thomson and Majumdar 1981; Thomson et al. 1982).

In this review, the main emphasis will be placed on nutritional problems that begin with disturbances of stomach and intestinal functions. For more general material on alcohol and nutrition, see Langman and Bell 1982; Nazer and Wright 1983; and NIAAA 1979, 1982. In addition, Ketcham and Mueller (1983) have written a practical account for the general public.

According to Burbige and colleagues (1984), there is ample evidence, clinical and experimental, that alcohol causes acute gastritis—and the potential for hemorrhage—by causing reversible lesions in the mucous membrane of the stomach. In chronic alcoholics, the long-term, partially reversible effect can be superficial or atrophic gastritis, which is associated with mucosal bleeding and gastrointestinal loss of proteins. However, there is no evidence that alcohol causes peptic ulcers.

Burbige and colleagues, also reporting that diarrhea is a common complaint of binge-drinking alcoholics, attribute to this condition a loss of potassium, magnesium, and phosphate. In addition, chronic exposure to ethanol in binge drinkers is often linked with vitamin and protein deficiencies. The principal B vitamins of concern in these cases are folic acid, thiamine, and vitamin B_{12}.

Malabsorption of nutrients in the small intestine is a key factor in the malnutrition that so often accompanies alcoholism (Jian and Modigliani 1980). Damage to the intestinal mucous membrane interferes with physiological absorption of vitamins, minerals, proteins, and amino acids (Nazer and Wright 1983; Thomson et al. 1982).

Therapeutic correction of nutrient deficiencies should be planned carefully by a physician, who must take into account the most recent experimental findings (Kaysen and Noth 1984; Lieber et al. 1982). Especially in the case of vitamin A deficiency, Lieber (1984, 1985) has cautioned that a dietary supplement of this nutrient can actually enhance liver damage. Without some therapeutic intervention, however, the chronic alcoholic who lacks sufficient vitamin A will experience night blindness, and the male alcoholic in whom vitamin A and zinc are insufficiently utilized will suffer sexual impotence and/or gonodal atrophy (Bonjour 1981). Lieber and colleagues (1982) have also sounded a note of caution regarding replacement of proteins lost as a result of alcoholism.

Here it is assumed that an appropriate assessment of the patient's nutritional needs cannot be made until after several weeks of alcohol abstinence. When there are indications of multiple deficiencies, medical supervision is essential. This should begin early, in order to prevent or manage withdrawal symptoms that, although temporary, may themselves be traumatic. The goal is to reverse, safely and as completely as possible, the damaging effects of alcohol dependence.

Sexual Functions. Last, but not least, is the question of reversing the unfortunate effects of alcohol misuse on all aspects—biological, social, and psychological—of sexual function. This very active area of research has been reviewed in an earlier issue of *Alcohol Health and Research World* (Moore 1985/86), and NIAAA offers an annotated bibliography on the subject of sex-related alcohol effects (NIAAA 1985). Where reversal of these effects has been attempted, the results have varied considerably from one individual to another. An important complicating factor is liver disease. In general, it can be said that (1) the earlier the source of the problem is identified, the better the chances for recovery; (2) alcohol abstinence is usually the first step in treatment; and (3) even when abstinence is combined with nutritional therapy, full recovery has been reported for a minority of the male patients who have serious problems.

SUMMARY

According to clinical and experimental research reports, some problems resulting from alcohol consumption can be completely reversed and others can be alleviated. Coping with acute effects depends on a basic understanding of how alcohol is metabolized. Other substances should be taken into account as well. These include nonalcoholic congeners usually found in alcoholic drinks, chemicals encountered in the environment, and other drugs that interact with alcohol in the body. Reversing problems that result from chronic alcohol abuse requires arresting or correcting both direct and indirect effects in brain, liver, heart, muscle, stomach, intestines, and sex organs. Serious conditions call for individualized medical supervision. ■

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EPIDEMIOLOGIC BULLETIN NO. 13

Trends in Alcohol-Related Fatal Traffic Accidents

United States, 1977–1984[1]

Terry S. Zobeck, Ph.D.
Gerald D. Williams, D. Ed.
Darryl Bertolucci, M.A.

For persons between 1 and 40 years of age, traffic accidents are the leading cause of death in the United States (Committee on Trauma Research 1985). Furthermore, alcohol has been cited as a contributing factor for as many as 50 percent of all deaths caused by traffic accidents (USDOT 1985).

For these and other reasons, NIAAA's Alcohol Epidemiologic Data System (AEDS) monitors alcohol-related[2] traffic accidents and fatalities and reports periodically on various aspects of the problem (e.g., Aitken and Zobeck 1985; Grigson et al. 1985. Malin et al. 1982; Verdugo et al. 1983; Zobeck et al. 1984).

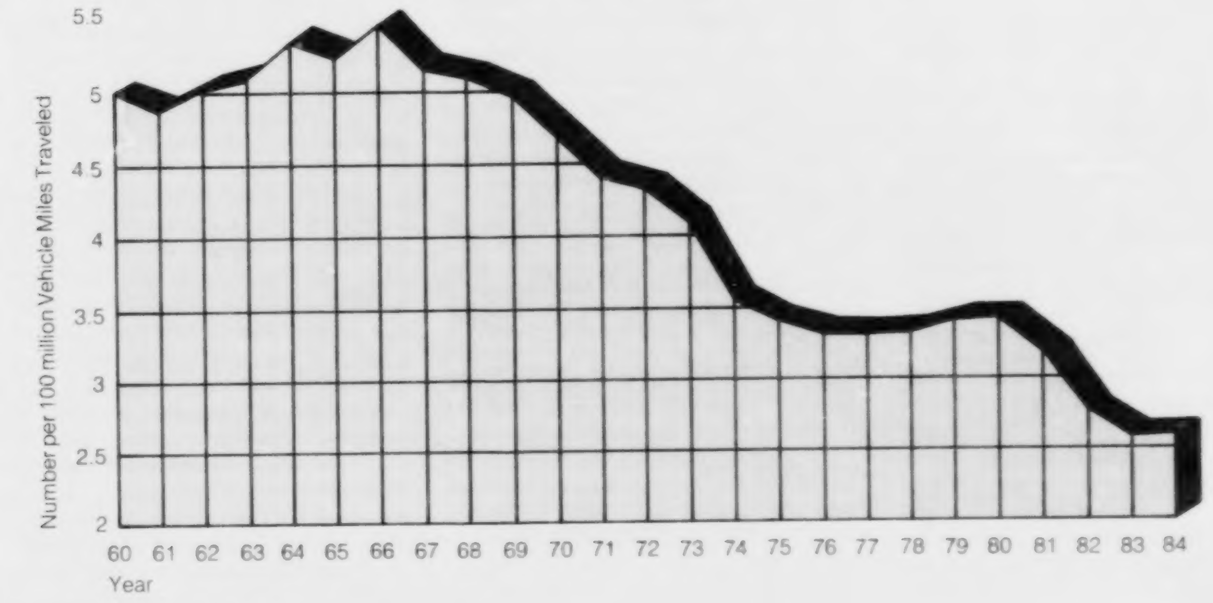
The purpose of this paper is to examine trends in alcohol-related traffic fatalities, person roles in alcohol- and non-alcohol-related traffic fatalities, and rates of BAC (Blood Alcohol Concentration) testing for the years 1977-84. Most of the findings presented here are abstracted from a surveillance report recently completed at AEDS (Zobeck 1986).

Data Sources, Definitions, and Limitations

Data for the study were obtained from files in the Fatal Accident Reporting System (FARS), which is operated by the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation in cooperation with the 50 States, the District of Columbia, and Puerto Rico.

FARS is a fully automated data bank containing information on every traffic accident that (1) occurs on publicly used

Figure 1 **Rate of Motor Vehicle Fatalities per 100 Million Vehicle Miles Traveled, 1960–1984.**



Source: Fatal Accident Reporting System 1985 roadways and (2) kills at least one person within 30 days of the accident. Detailed data on the conditions of each fatal accident, the vehicles involved, and the driver(s) and other person(s) involved are collected and encoded.

Alcohol involvement is estimated by three criteria: (1) *alcohol-involved*—the judgment of the investigating officer as to whether alcohol is present; (2) *BAC test*—results of any of several chemical tests that measure the amount of alcohol in the blood; and (3) *DWI or DUI citation*—driving while intoxicated (DWI) or under the influence of alcohol (DUI) at the time of the accident.

An accident is considered alcohol-involved if any one of these variables is coded "yes" for at least one driver involved in the accident. All fatalities in such accidents are considered to be alcohol-involved.[3]

Alcohol involvement rates derived from FARS should be viewed as conservative estimates. Police sometimes are reluctant to judge alcohol involvement even in fatal accidents; yet, when they do so, they are correct more than 90 percent of the time (Mercer 1985). Also, BAC tests are not administered consistently or routinely across different traffic jurisdictions (USDOT 1986). Finally, DWI or DUI citations are rare (only about 5 percent of all drivers involved in fatal accidents are cited each year).

TRENDS IN THE RATES OF TRAFFIC ACCIDENT DEATHS

Figure 1 presents 1960-84 national traffic fatality rates per 100 million vehicle miles traveled (VMT) and is displayed to provide some perspective on the 1977-84 trend data presented later. In 1984, there was a marginal increase in the rate over 1983.

Other rates—e.g., alcohol- and non-alcohol-involved deaths per 100 thousand population, per 100 thousand registered vehicles, and per 100 thousand licensed drivers—have been published (Zobeck 1986). Trends in these rates are generally consistent with those presented here.

Table 1 summarizes 1977-84 trends in the number of traffic accidents, traffic accident fatalities, and alcohol-related traffic fatalities. The percentage of all traffic accident fatalities that were alcohol-related increased by 5.4 percent from 1977 to 1984.[4] During this same period, total traffic deaths decreased by 7 percent. However, when risk variables—such as VMT, the number of registered vehicles, and the number of licensed drivers—are used to estimate alcohol-involved rates, all rates show a decrease between 1977-84, especially following 1980.

While deaths for all age groups have decreased since 1977, total deaths, driver deaths, and alcohol-involved driver deaths for young persons (aged 16-24 years) are down nearly twice as much as those in other age groups. However, the 16-to-24 group suffered 35 percent of all such deaths in 1984, while constituting only 20 percent of the total U.S. population.

PERSON ROLE IN FATAL TRAFFIC ACCIDENTS

Analysis of FARS data suggests that alcohol involvement in an accident varies with a person's role—i.e., driver, passenger, pedestrian, or other. In 1984, 49 percent of all driver deaths were alcohol-related; alcohol involvement in passenger deaths was only slightly lower, at 45 percent.

Figure 2 shows the percentages by person role, of those involved in alcohol- and non-alcohol-related traffic fatalitites in 1977 and 1984.The person-role analysis shows that drivers are the most likely to die in both types of accidents. Also, drivers in alcohol-related accidents are more likely to die than drivers in non-alcohol-related accidents.

More detailed data on drivers indicate that, while the number of drivers involved in all fatal accidents has dropped by 4 percent since 1977 (from 59,832 to 57,498), the number of drivers involved in alcohol-

Table 1 **Fatal Traffic Accidents, Traffic Accident Fatalities, and Alcohol-Related Traffic Accident Fatalities, 1977-84.**

Year	All Fatal Traffic Accidents	Traffic Accident Fatalities	Alcohol-Related Traffic Accidents	
			Raw Numbers	Percentage of Total
1984	39,622	44,241	18,523	41.9
1983	37,971	42,584	17,847	41.9
1982	38,899	43,721	18,622	42.6
1981	43,979	49,268	20,658	41.9
1980	45,271	51,077	21,114	41.3
1979	45,212	51,084	20,245	39.6
1978	44,433	50,327	18,362	35.6
1977	42,064	47,715	17,414	36.5

Source: Fatal Accident Reporting System, 1985

Figure 2a **Non-alcohol-Related Traffic Fatalities by Person Type, 1984**

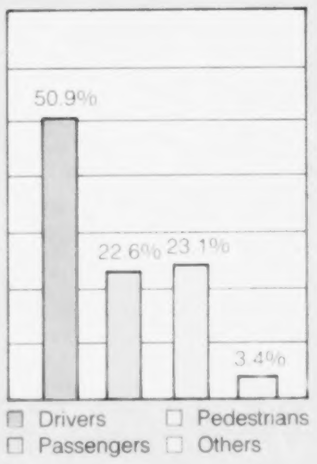
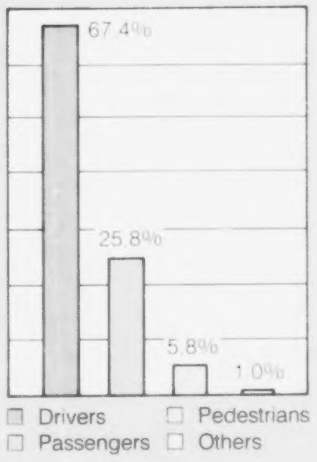


Figure 2b **Alcohol-Related Traffic Fatalities by Person Type, 1984**



related accidents has increased by 9 percent (from 15,827 to 17,225). Closer examination of this increase reveals that the number of alcohol-involved male drivers increased by only 5 percent (from 14,199 to 14,946), while the increase of alcohol-involved female drivers was 40 percent (from 1,628 to 2,273).

RATES OF BAC TESTING

Rates of BAC testing vary widely across the States, and rates differ also by driver's vital status (dead or surviving), sex, and age. In 1977, only 11 States tested their dead drivers 80 percent or more of the time. By 1984, 23 States tested dead drivers 80 percent or more of the time. From 1977 to 1984, testing of dead drivers in fatal accidents increased by about 18 percentage points across all age groups. (See table 2.)

Data on all drivers who tested positive on BAC tests indicate that the majority of these drivers, regardless of sex or age, are intoxicated at the time of the accident. The average BAC level for drivers was either .16 or .17 for each of the eight years of the study. Young drivers (aged 16-24 years) had lower BAC levels, even though they are more likely than older drivers to be involved in a traffic accident.

CONCLUSIONS

Data presented in this report suggest a reduction in the problem of alcohol involvement in fatal traffic accidents. The figures show a decrease in the rates of alcohol-related fatalities and an increase in the frequency of BAC testing. These indicators also suggest that many of the drinking-and-driving countermeasures adopted in the past few years may have been successful (NCADD 1985).

Many problems remain, however. Young drinking drivers continue to be overrepresented in fatal accidents, and the vast majority of drinking drivers have BAC levels at or higher than legal definitions of intoxication. The finding that 18,000 alcohol-related traffic fatalities occurred in 1984 leaves considerable room for continued and strengthened efforts to reduce the human and economic costs of alcohol abuse on the Nation's highways. ■

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Table 2 **Ages of Drivers Involved in Fatal Traffic Accidents and Given BAC Tests: 1977 and 1984.**

		1977 Drivers			1984 Drivers		
Sex	**Age (years)**	**Dead (Percent)**	**Alive (Percent)**	**Combined (Percent)**	**Dead (Percent)**	**Alive (Percent)**	**Combined (Percent)**
Male							
	16-19	1,974 (55.7)	964 (20.1)	2,938 (35.2)	1,886 (73.2)	1,001 (31.7)	2,887 (50.3)
	20-24	2,914 (59.2)	1,248 (21.6)	4,162 (38.9)	3,425 (77.8)	1,616 (33.3)	5,041 (54.4)
	25-34	2,974 (59.4)	1,206 (17.4)	4,180 (35.0)	4,132 (76.6)	1,843 (26.6)	5,975 (48.5)
	35-44	1,363 (58.6)	528 (13.7)	1,891 (30.6)	2,012 (76.4)	868 (21.4)	2,880 (43.1)
	45 +	2,540 (47.5)	633 (11.3)	3,203 (28.5)	3,131 (65.1)	873 (16.2)	4,004 (39.3)
	Total	11,765 (55.7)	4,609 (16.9)	16,374 (33.9)	14,586 (73.6)	6,201 (25.4)	20,787 (47.0)
Female							
	16-19	363 (51.3)	107 (9.4)	470 (25.5)	489 (70.2)	176 (19.0)	665 (41.0)
	20-24	482 (54.4)	133 (19.2)	615 (29.7)	705 (73.4)	250 (21.2)	955 (44.7)
	25-34	493 (53.2)	127 (8.6)	620 (25.8)	849 (70.0)	307 (18.1)	1,156 (39.7)
	35-44	292 (51.8)	92 (10.2)	384 (26.3)	565 (67.9)	155 (14.9)	720 (38.4)
	45 +	588 (39.9)	105 (7.1)	693 (23.4)	1,029 (58.7)	168 (11.2)	1,197 (36.8)
	Total	2,218 (48.7)	564 (9.1)	2,782 (25.9)	3,637 (66.8)	1,056 (16.6)	4,693 (39.8)

further information, contact Dr. Zobeck at AEDS, 1400 Eye Street, NW., Suite 600, Washington, DC 20005.

FOOTNOTES

[1] The data for this report and additional information are available from the Alcohol Epidemiologic Data System (AEDS), specifically *Surveillance Report No. 1: Trends in Alcohol-Related Fatal Traffic Accidents, United States, 1977-1984* (Zobeck 1986).

[2] The terms "alcohol-related" and "alcohol involved" are used interchangeably here.

[3] These data differ from those presented by NHTSA because of different methodologies used to estimate alcohol-related fatalities. NHTSA constructs alcohol-related estimates based upon data from 15 States that test 80 percent or more of the drivers in fatal accidents.

[4] A new methodology for estimating alcohol involvement, developed by NHTSA, uses driver characteristics, past DUI citations, and other data from States reporting 80 percent or more BAC testing to determine the probability of alcohol involvement in cases where data are missing (USDOT 1986). This method may be used in future trend analyses conducted at AEDS.

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Relapse Prevention Planning

(continued from page 11)

The best inpatient treatment will fail to prevent relapse unless outpatient treatment is readily available to patients at moments of need. Since 50 to 60 percent of all relapses occur within 90 days of discharge, it is essential that intensive outpatient treatment be scheduled during that period (Marlatt 1985). As recovery progresses, the patient needs ready access to supportive crisis-intervention sessions and regular relapse-prevention planning update sessions. This combined approach to inpatient and outpatient management of relapse-prone alcoholics, based on the biopsychosocial model of relapse prevention, can improve the recovery chances of alcoholic patients who currently die from alcoholism. ■

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Long-Term Withdrawal

(continued from page 11)

for coping with the symptoms when they emerge. By keeping daily logs of symptoms, patients can identify the acute and chronic stressors that cause them. Then it is possible to avoid PAW episodes by learning to cope more effectively with those stressors.

Proper diet, exercise, and rest are important in the management of PAW. A well-balanced diet supplemented with vitamins is helpful. Regular periods of aerobic exercise followed by meditation or relaxation training also assist in PAW management.

PAW reality testing—learning to receive and appropriately utilize the environmental feedback to check for the presence of symptoms—is another important aspect of PAW management. Patients must learn to recognize and acknowledge these symptoms. By talking about PAW and learning to accomodate the presence of symptoms, positive improvements can be made in the life of anyone experiencing symptoms of PAW. ■

—*Terence Gorski*

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Reader's Exchange

Caffeine Use in the Recovering Alcoholic

J. S. Verinis, Ph.D.

A survey was conducted of 56 alcoholics involved in an outpatient treatment program regarding their consumption of beverages prior to treatment, 1 month after beginning treatment, and at the time of the survey. The only significant reported change was an increase in coffee consumption after the alcoholic stopped drinking. Recent research, especially that by Gilliland and Bullock (1984*a*), highlights the negative effects of excessive caffeine use. Anxiety, depression, and irritability are the related psychiatric sequelae (Gilliland and Bullock 1984*a*, 1984*b*; Veleber and Templer 1984). Impairment of short-term memory, decreased efficiency in handling complex tasks (Anderson 1984), and a decline in college grades (Gilliland and Bullock 1984*b*) also have been observed.

These symptoms parallel those noted in the Post Acute Withdrawal Syndrome (PAWS) (Miller et al. 1980) in recovering alcoholic patients and raise some interesting speculation about the caffeine use of recovering alcoholics. Although not much research has been focused on this topic, Istvan and Matarazzo (1984) suggest a linkage between heavy alcohol and heavy caffeine use. Our study is designed to expand this knowledge base.

PROCEDURE

The subjects were 56 recovering alcoholics from low socioeconomic levels in the outpatient aftercare alcohol program at the West Side Veterans Administration Hospital in Chicago. They were given a questionnaire that included some brief demographic items and the following questions: In the 6 months prior to treatment, how much did you drink of these other substances in an average day?: (1) water—number of glasses (2) milk—number of glasses (3) juice—number of glasses (4) regular coffee—number of cups (5) decaf coffee—number of cups (6) tea—number of cups (7) pop or soda—number of glasses or cans—name of favorite brand ____________ (8) decaf pop—number of glasses or cans (9) other ____________ (10) How many chocolate bars and candies did you eat? __________. The subjects were asked to answer the same questions about their current consumption and their consumption during the first month of sobriety. They were asked to rank themselves on a 4-point anxiety, depression, and irritability scale and were asked to complete Zung's depression scale (Zung 1965) and Spielberger's State-Trait Anxiety Inventory (STAI) test (Spielberger et al. 1970).

RESULTS

The results are reported in Table 1. The quantities of each beverage consumed at the 3 different time periods (present, first month of treatment, 6 months prior to treatment) were compared using the one-way analysis of variance (Winer 1962). Only the difference in coffee usage reached a significant level (see Table 1), with significantly more coffee being consumed at present and during the first month of treatment than 6 months prior to treatment.

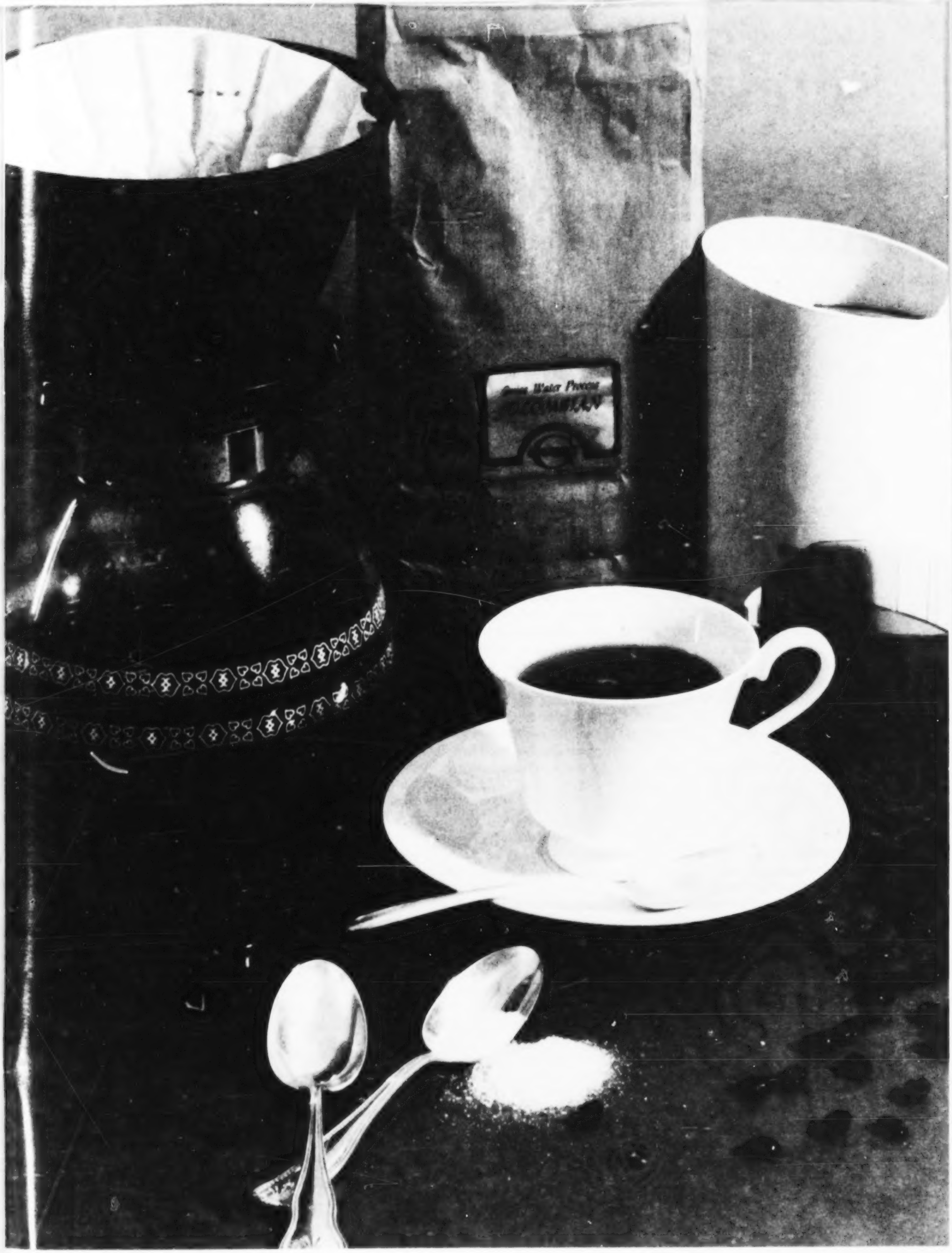
Since coffee was the only beverage provided free of charge by the treatment program, it was unclear whether the change in coffee consumption was based on properties of the coffee itself or on the fact that it was a free beverage. Two additional studies were designed. In one study, 32 alcohol patients were offered free juice or lemonade

(continued on page 79)

Table 1 **Nonalcoholic Daily Beverage and Candy Consumption Prior to and During Treatment for Alcoholism**

Treatment Stage	Water[1]	Milk[1]	Juice[1]	Coffee[2]*	Decaf[2]	Tea[2]	Soda[3]	Choc.[4]
6 months prior (n=56)	4.12	1.07	1.04	2.20	.22	.65	2.11	1.78
1 month after start (n=56)	5.33	1.48	1.54	4.89	.28	.89	2.17	2.09
Present (n=53)	4.87	1.26	1.47	4.89	.51	.68	2.15	1.60

[1] Average number of glasses
[2] Average number of cups
[3] Average number of cans
[4] Average number of bars
* Differences significant (F = 11.84, df = 2, 162, $p \leq .01$)


Water Process

Alexander Tucker

Similarities in Family Dynamics of Incest and Alcohol Abuse

Issues for Clinicians

RAY E. LILES, D.S.W., L.C.S.W.
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Clinicians are becoming increasingly aware that adults who present themselves for psychotherapeutic treatment frequently have a developmental history that includes incest, alcoholic parents, or both. It is not unusual to see histories of childhood incest or family-of-origin alcoholism producing very similar conflicts and emotional problems in adults. In many of these cases the family history of incest and/or alcoholism is multigenerational.

This article explores the relationship between alcohol and incest and is based primarily on the writers' clinical experiences in a specialized intrafamilial child sexual abuse treatment program, the Riverside (CA) Interagency Sexual Abuse Council (Liles and Wahlquist 1981), and general counseling experiences. For the sake of simplicity and clarity, we are limiting the scope of this paper to a discussion of father-figure-and-daughter incest cases, and we will assume that in the alcoholic families discussed the father is the identified alcoholic. We do recognize, however, that sons are frequently incest victims, that mothers can be incest offenders, and that mothers can be alcoholics.

STATISTICAL RELATIONSHIP BETWEEN ALCOHOL AND INCEST

Russell (1984), in a random sample of 930 adult women, found that 4.5 percent had been sexually abused before 18 years of age by a father figure. We can reasonably suspect that alcohol abuse in a family increases the risk that a child might become the victim of incest. Deutsch (1982, p. 3) states that there are "at least 15 million school age American children living with parental alcoholism," and Black (1981, p. 141) asserts that her research "indicates 26 percent of children in alcoholic homes have been incest victims." Thus, as many as 3 to 4 million children in this country may be living in homes that are both alcoholic and incestuous.

Liles (1984) reports that in a sample of 170 father-figure perpetrators of father-daughter incest, 45 percent consumed alcohol just prior to the instances of molestation and 38 percent were judged to be "alcoholic" by their therapists. While the complex relationship between alcohol abuse and incest behavior in families has not yet been elucidated, these figures should suggest that when helping professionals uncover alcoholic family dynamics, they should investigate the possibility that other forms of abuse, such as incest, may be occurring.

DESCRIPTION OF INCEST CASES

Father-daughter incest, as a treatment specialty, began to generate literature in the late 1970s (Armstrong 1978; Forward 1978; Giaretto 1976; Herman 1981; Meisleman 1979). However, large-sample, treatment-related research has been slow in developing. The following section is a brief description of father-figure incest cases in treatment.

Liles (1984) surveyed 264 therapists treating father-figure-and-daughter incest cases in specialized child sexual abuse treatment programs around the United States. All 264 respondents answered demographic questions on one randomly chosen incest case from their own caseloads. The following data are derived from that study.

The natural fathers of the victims were the perpetrators in 44 percent of these incest cases, while stepfathers were the perpetrators in 42 percent of the cases. Other "father figures" accounted for 14 percent of the sample. The perpetrators were a mean of 37.6 years of age (SD = 7.8 years) and had been married an average of 1.6 times (SD = 1.5). They had a mean income of $17,500 (SD = $2,600) and an average educational attainment of 12.1 years (SD = 4.5).

The victims' mothers were most frequently their natural mothers (90 percent). The mothers' mean age was 35.3 years (SD = 6.5), and they had been married a mean of 1.5 times (SD = .64). They had attained an average educational level of 11.8 years (SD = 2.8). Their mean income (apart from spouse) was only $5,676. Over one-fourth of the mothers (28 percent) had no income at all apart from the spouse's.

There was an average of 2.64 (SD = 4.55) children in the family and more female (63 percent) than male (36 percent) children. The father figures were living at home with the victims in 95 percent of the 264 cases.

The average age of the daughter-victim when the molestations began was 9.05 years (SD = 3.2 years). The molestations lasted a mean of 36.3 months (SD = 32.6 months). Only 37 percent of the 264 victims had been molested for less than a year.

The type of sexual behaviors that occur in father-figure-and-daughter incest vary. Although many legal and lexicographical definitions of incest include the elements of "intercourse" and "between blood relatives or relatives prohibited by law from marriage," most incest treatment programs do not define incest that narrowly. As can be seen in Table 1 below, intercourse occurs in less than half the cases.

Given that the mean age of the father-figure-and-daughter incest victims is 9 years at the time of the first molestation and that the molestations occur over a (mean) period of 3 years, one might surmise that the sexual behaviors in incest are progressive in nature. In fact, this is often the case. Quite often father figures will "play a game" with the victim or engage the victim in appropriate physical affection and gradually cross the line into sexual behavior. Almost half (48 percent) of the father figures in Liles' (1984) study were reported to have used no overt coercion to begin the molestations. The father figures seduced initially compliant children. Some fathers (18 percent) did, however, use physical force.

HOW ALCOHOL AND INCEST RELATE

Alcohol is frequently used by perpetrators of father-daughter incest as a disinhibitor to make it easier to commit the molestations. These fathers also attempt to use alcohol as a defense against the guilt and shame they feel once the molestations have been disclosed. They typically say, "I don't remember; I was drunk"; or, "I would never have done that if I hadn't been drinking." As you might expect, these are not usually fathers who got drunk and molested a child one time and then felt bad and stopped, never to molest again. Our experience has been that these fathers will begin to molest their daughters when they have been drinking and will often establish drinking patterns where they "set up" molestation situations.

Both alcohol abuse and incest are compulsive behaviors. Incest perpetrators frequently say, "I knew it was wrong and each time I did it I felt guilty and wanted to stop. I told myself I would never do it again." Yet, many of them are unable voluntarily to stop their behavior. Incest perpetrators frequently stop only when the victims are able to threaten them with disclosure or when the victims disclose the molestation and the mothers and/or authorities restrict access to the children.

SIMILARITIES BETWEEN INCEST DYNAMICS AND ALCOHOLISM

Incest and alcoholism are family problems in which there is a primary illness (alcoholism or incest) interacting with a dysfunctional family system (Kellerman 1984). Both problems can be seen as being partially caused by maladaptive responses to stress, unmet needs for emotional closeness, and a hunger for control and/or power. Giaretto (1982) claims that fathers who molest their daughters do so out of self-hate. Alcoholics on the way to self-destruction have also been seen as manifesting self-hate. Both incestuous fathers and alcoholics are engaging in behaviors that may result in public disgrace, damaged careers, emotional damage to family members, jail, and eventual destruction of their families.

Fathers in incestuous families resemble alcoholic fathers in their heavy use of denial, minimization, and rationalization. When initially confronted about the possibility that incest is occuring or has occured, many incestuous fathers will adamantly deny it. Even when incestuous fathers get to the point of being able to admit that it happened, they will often deny that it hurt the victim; or they will minimize the impact of the incest on the victim in the same way that many alcoholic fathers will deny or minimize the impact of their drinking on family members.

Secrecy is a hallmark of both of these sets of families. One developmental issue in alcoholism is "secret" drinking or attempts to disguise liquor consumption in some way. Similarly, incest behavior is heavily dependent on its being kept a secret from other family members and from outsiders for obvious reasons. As the incest or alcoholism progresses, it becomes an almost "open" secret in some families. No one is supposed to know what is really happening, but some family members and others in the family's limited social network either become aware of or suspect the incest and/or the alcoholism.

Related to this need for secrecy is the social isolation these families experience. Many of them are socially isolated prior to the onset of the alcoholism or the incest. They are unable to get their emotional needs met within the family, and they have few outside resources to use. Unfortunately, as incest or alcoholism develops, the need for keeping the secret increases, a situation that results in even greater social isolation. Ackerman (1983, p. 13) describes this isolation as a "negative anonymity." Isolation contributes even further to the family dysfunction because it so severely limits the opportunity for positive social interactions, social support, and professional help. Clearly, the development of self-help programs such as Parents United (for families that have experienced incest), Alcoholics Anonymous, and Al-Anon, are, in part, attempts to reverse this destructive process of social isolation.

Members in both sets of families have been described as lacking communication skills. Deutsch (1982, p. 56), describing faulty communications in alcoholic families, calls them "ambiguous and indirect," and Sgroi (1982) describes mothers in incestuous families as modeling poor communication and sending mixed or ambivalent messages. Family members frequently speak for each other and operate on many unspoken assumptions about what is "really" being communicated. They often assume that if the spouse, child, or parent "really loved" them, there would be no need to communicate in a more direct way because the other person would know what they want or feel.

A systems interpretation of the incestuous family that can be applied equally to either the alcoholic or the incestuous family is that the family, through the development of the system, is attempting to maintain its homeostasis and keep itself together (Lustig 1966). At various times during the developmental life cycle of a family, there is a combination of individual pathology, changing family roles, and external pressures on family

Table 1 **Father-Figure-and-Daughter Incest (n = 264) Type and Frequency of Sexual Behavior**

Sexual Act	Percentage of Cases
Fondling the victim's genitals	79
Victim having breasts fondled	71
Fondling the father figure's genitals	53
Oral sex	52
Vaginal intercourse	40
Voyeurism by the father figure	25
Exhibitionism by the father figure	21
Other	15
Anal intercourse	5
Unknown	3

members. This creates internal pressure either to disband the family or somehow to adjust to the changes in the family system. In both alcoholic and incestuous families, subtle moves are made to "stay and adapt" to the alcoholic or incestuous behavior (Wegscheider 1981).

The process of staying and adapting to the developing incest and/or alcoholism results in a distortion of family roles. In incest cases, the mother's role as protecting parent becomes greatly diminished. She often withdraws from family interaction by going back to work or school, becoming depressed, or just generally being emotionally unavailable to her husband and her children. Many mothers in incestuous families have huge dependency needs and sometimes find themselves in a position of "not seeing" or somehow tolerating the developing incest dynamics and general family dysfunction. In effect, these mothers are "enabling" the incestuous father to commit incest. Mothers in incestuous families will also occasionally exhibit the massive denial seen in codependent members of alcoholic families. These mothers refuse to believe their daughters' disclosures of the molestations because believing them would force the mothers to recognize the enormity of the problems in the family and their role in the problems.

Another example of role distortion is the way in which children in both incestuous and alcoholic families frequently become pseudoadults and parental caretakers. The role of the incest victim within the family typically changes as the incest dynamics develop. A role reversal develops, and the child is expected to fulfill the father's emotional needs and, later, his sexual needs. The victim also frequently feels as if she needs to protect the mother from knowledge of the incest. In many cases the victim also has to protect the perpetrator from the consequences of disclosure. These are both reasons why incest often goes on for some time before it is finally disclosed. In addition, the child in this pseudoadult role often takes over many adult responsibilities, such as preparing meals, supervising younger children, escorting the father, and even paying bills. As the incest develops, she finds herself functioning in quasi-maternal, quasi-spousal roles at home (Sgroi 1982).

Children in alcoholic and incestuous families often feel somehow at fault for the family problem. An incest victim feels as if there is something about her that caused her father to molest her. Children in alcoholic families frequently feel that their "bad behavior" is somehow responsible for their fathers' drinking.

Another common response children have is to lose trust in their parents. Black (1982, p. 39) says, "Children raised in alcoholic family structures have learned how not to trust others . . . [They] have also learned it is simply best not to trust that others will be there for them emotionally, psychologically, and possibly even physically." This assertion equally applies to children raised in sexually abusive families.

Children in alcoholic and incestuous families often respond to the disturbing family dynamics by beginning to act out their anger, fear, confusion, and need for help (Deutsch 1982). They may be crying out for help for themselves or for the entire family. Sometimes the acting-out behavior is used by other family members to scapegoat the child (Wegscheider 1981) and to draw attention away from the alcohol abuse and/or sexual abuse.

IMPLICATIONS FOR TREATMENT

Several similarities in treatment issues confront the therapist who works with either alcoholic or incestuous families. No effective therapy can take place with those individuals who refuse to recognize the existence of the problem; thus, one of the first issues addressed and worked through must be denial. The perpetrator of incest and the alcoholic both must come to accept full responsibility for their behavior. Fathers who commit incest will often try to project blame for the incest on the supposedly "seductive" daughter in the same way an alcoholic will claim that a family member "drove me to drink." Fathers who have committed incest not only need to accept responsibility but also need to tell their victims, their wives, and other family members that what they did was wrong and that they accept the responsibility not only for doing it but also for the events that may have occurred after the disclosure, such as criminal trials.

Related to and concurrent with this issue is the confrontation and education of mothers and other family members regarding the attitudes they communicate that enable the perpetrator or alcoholic to continue to deny and minimize the behavior and its long-term destructiveness. This includes mothers and others recognizing the therapeutic importance of legal consequences and financial sanctions against the father. He needs to have concrete evidence that what he did was wrong and that he is expected by society and by the family to face the consequences of his actions.

Treatment of fathers who use alcohol consumption as part of their attempt to defend themselves and avoid responsibility for their actions, involves immediate and continual confrontation of their behavior, thought patterns, and rationalizations. In group treatment programs such as Parents United (Giaretto 1982), there needs to be a clear group norm that the "I was drunk" defense is not adequate or acceptable. At the same time, there needs to be a humanistic group environment that differentiates between the person and the offense.

Fathers who have committed incest, are alcoholic, and still drinking present an even more difficult treatment challenge. In the writers' specialized child sexual abuse treatment program, a decision was made some time ago—based on clinical experience—that incest perpetrators who are still drinking are not candidates for admission into the Parents United treatment program. These fathers are referred to Alcoholics Anonymous (AA) and asked to return when the drinking stops. Even though the drinking perpetrators are referred elsewhere, their wives are admitted to Parents United, and their victims are admitted to Daughters and Sons United.

Group therapy is essential to the effective treatment of incest and alcoholism and needs to occur concurrently with individual therapy. It is the most effective means of confronting denial, minimizations, and rationalizations. Self-help groups and group therapy provide a milieu of people with similar experiences united in a common goal. Group members can provide each other with a level of support, confrontation, and camaraderie not available in individual therapy. One commonality between incest and drinking perpetrators is the intensity of adherence to their respective self-help programs—Parents United or AA. Not only do these groups provide an excellent resource for learning socialization skills; they also often become the extended family and social support network that individuals and families have needed for some time. In recognition of the importance of creating a new social support network for incestuous families, Giaretto (1982) changed the name of his "Child Sexual Abuse Treatment Program" to the "Institute for Community As Extended Family."

Education about normal family patterns is another essential feature of therapy. Because of the victim's role reversal, distorted roles of family members, and the intergenerational aspects of incest and alcoholism, all family members are confused about—and frequently not aware of—what constitutes normal child and family development. Ackerman (1983) sums it up for both of these sets of families when he describes adult children of alcoholics as spending their adult lives "guessing" what a normal family is supposed to be like.

Requisite parts of therapy for individuals in alcoholic and incestuous families, as well as for most families in family therapy, are learning how to identify and express feelings and needs, how to communicate more directly with each other, and how to behave assertively. These new skills are vehicles through which appropriate expression and attainment of human needs can be achieved.

The family dynamics of incest and alcoholism are similar in etiology. In many families, these very severe problems are found in conjunction. However, even in comparing families where only one of these two problems exists, the similarities in terms of unmet emotional needs, poor communication patterns, dependency, isolation, distorted family roles, defenses used by the incest perpetrators and the alcoholic fathers, and enabling by other family members can be amazing. As clinicians in the fields of alcoholism and incest begin to realize that they are working with many of the same families and that many of the same kinds of family dynamics are seen in both situations, further clarification and explication of the issues discussed in this paper should emerge. ■

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The Mystery of Craving

(continued from page 17)

source of perceived relief or pleasure, namely, alcohol. Finally, although it varies in strength, craving need not culminate in drinking.

What does this mean for the recovering alcoholic? For successful rehabilitation, alcoholics will find it helpful to know as much as possible about their individual bells and the ways in which other forces, such as the environment, impinge upon them. They also should become more aware of just why craving arises. Through greater self-knowledge and awareness, forces that impede recovery can be subject to control by the alcoholic. ■

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Based on a chapter from Sobriety: Strategies for Recovery, *which will be published by Oxford University Press in 1987* *© Oxford University Press, Inc.*

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Lifestyle Rehabilitation

(continued from page 18)

it is important not to use these meetings as refuges, shunning new concepts and social networks in the community-at-large. How does one ease into disparate groups at work, school, or elsewhere? How does one learn to discuss one's past casually, in order to make new friends, just as dependent people do? While some people find ways to fit in—again, fortuitously—others never discuss pathways to broader affiliations, never overcome the fear of stigma. Recovery remains grievously incomplete for those who aren't helped toward real social integration and the opportunities it brings.

Creating New Goals. Abstinence can be an end in itself—at first. But, lest all one's efforts grow pointless, recovery must evolve toward viable new opportunities: to contribute, to create, to share, and to appreciate. One must find fulfilling, and not just safe, roles as an individual and as a member of family and community. This multifaceted but crucial task is frequently neglected. It must be aided, gently for sure, even early on as the mind and spirit begin to clear from the myopia of alcohol and drugs.

Talk with people who have made model recoveries and you will observe how achievements such as the above figure prominently in their lives. Conversely, I suspect that failure to make such gains will correlate with shaky abstinence and active relapse, even for people who begin a committed recovery. There should be no surprise in this; surely, we can understand how even a strong commitment may erode when a person is assaulted by craving, remains unfed by new pleasures, feels alienated from the world at large, or is directionless in the mainstream of life. And yet, such erosions are common, and they are just as commonly confused with a faulty commitment.

Why these failures in secondary recovery? Why this confusion between primary and secondary tracks? What do these issues mean for treatment programs?

I think so many people falter in secondary recovery—thus collapsing their primary gains—mainly because the specific needs and issues of lifestyle rehabilitation are not made clear to them and are not directly addressed. Having worked so hard and long to understand the upfront needs of recovery, the treatment field itself is only now coming to see farther down the road. And the second recovery track remains obscure for a reason that has to do with our treatment tools: We have invested so much in alcohol and drug education, family therapy, the Twelve Steps, and so on that we tend to define recovery phenomena almost exclusively in terms of those tools. To say this is not to indict AA or NA or psychotherapy. Far from it. The joining of professional services with spiritual fellowships has wrought powerful instruments. Their very effectiveness, however, has foreshortened, if sharpened, the therapeutic focus and made it somewhat easier to overlook the other recovery track. Counseling and Step Meetings do spotlight secondary recovery issues occasionally, but rarely systematically; no one therapy or setting can concentrate on both recovery tracks without seriously short-changing one of them.

Treatment programs should begin attending to secondary recovery with new tools. For one thing—since AA and NA already serve as primary-track vehicles for many people—rather than just playing supportive roles, treatment professionals can assume more responsibility for assisting clients along the parallel recovery track. Furthermore, helping clients who are already committed to changing their lifestyles can be easier than effecting their initial psychological rehabilitation. (A well-run secondary recovery program can leave most resistance and denial issues for the primary track modalities.) Third, the need in the treatment field for attractive, dollar-worthy outpatient and aftercare services could be superbly met if those modalities were to concentrate on secondary recovery interventions, which, after all, are most appropriate for outpatients who already get primary support through AA or NA.

Fourth, there are new tools specifically designed to ease the adaptations of secondary recovery, tools that make sound use of established principles of peer-group learning, of behavioral psychology, and of the lessons learned from countless long-term recoveries as well as relapses. My own efforts in this work with the Harvard University School of Public Health have helped create systematic secondary track curricula called Recovery Training, from which this article is drawn. Already demonstrated to be effective in reducing relapse in clinical trials, Recovery Training is, nonetheless, merely suggestive of future innovations that await the attention of providers.

And one final thought: Alcohol and drug treatment programs may be uniquely positioned to play even larger roles in the health promotion field. For, just as the Twelve Steps are proving potent in primary recovery from disorders other than alcoholism, better ways to facilitate lifestyle transformations for these populations are also still needed. Let our professional programs pioneer pathways of secondary recovery in the addictions fields and, thereby, create for themselves new opportunities in other health fields. ■

FRED N. ZACKON, M.ED., based in Newton, MA, is clinical director of Habit Management Institute, Inc., a private outpatient alcohol and drug abuse treatment program in Boston. Formerly clinical director of the Harvard University School of Public Health project that developed Recovery Training, he wrote the comprehensive programming manual, Addict Aftercare: Recovery Training and Self-Help. *It is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325. The order number is 017-024-01228-9; the price is $7.*

Problems in Predicting Recovery

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with the client. Each model fosters different expectations; hence, subtle but significant influences are exerted on treatment outcome. For example, some models can be compared with a course of antibiotic treatment—fostering attitudes about continuous booster treatment shots and long-term aftercare maintenance. Other approaches are analogous to vaccines: One course of therapy should be sufficient.

Finally, let me recommend that future studies include a checklist of goals, from the therapist's perspective as well as from the client's viewpoint. This checklist could be administered before and after treatment and could include a comparison between the client's goals and those of the therapist, as well as assessment of the dissonance or consonance between these goals. It would be particularly instructive in enhancing treatment delivery if discrepancies between the goals of the client and the therapist were clearly specified.

As care providers, we must warm to the notion that we study and measure our own attitudes as factors that can subtly influence treatment success. We may not like it, but if we are to enhance treatment effectiveness, this may be our only recourse. Otherwise, we risk a nihilistic stance and embrace biological reductionism, relegating our functions to purely pharmacologic cures. ■

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Recovery Without Treatment

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changing perceptions were seen: (1) a temporary period of denial of problems associated with drinking, followed by a decision to quit; (2) a slowly but steadily increasing awareness of the scope of drinking behavior and drinking-related problems; and (3) a sudden reorganization of perceptions, sometimes following a "significant accident" such as an embarassing drunken brawl. Most of the subjects reported experiencing withdrawal symptoms after they had quit drinking. Stall identifies several important themes in his subjects' resolution of their drinking problems. Among them are significant changes in lifestyle and the social support provided by others during remission and during subsequent efforts to maintain sobriety.

Tuchfeld (1981) employed a similar strategy in a larger study. Fifty-one subjects, screened by means of interviews and assessed for credibility and internal interview consistency, were determined to have resolved their drinking problems without formal treatment and were selected for testing and life-history compilation. The average period since active problem drinking was 6.4 years. All subjects completed a modified version of the Michigan Alcoholism Screening Test (MAST); the average score of the 51 subjects was 7.4. (A score of 5.0 or more is sufficient to diagnose alcoholism on the unmodified MAST.)

The subjects in this study gave a number of reasons for deciding to change their drinking patterns. Many of their reasons figure in the decisions of other alcohol abusers and alcoholics to enter treatment: personal illness or accident (17 subjects); a religious experience (13); drinking-related money problems (11); intervention by family members (9); and "extraordinary events" such as personally humiliating incidents, suicide attempts, or identity crises (15). Also noteworthy is the study's finding that social conditions contributed vitally to the maintenance of the subjects' resolution of their drinking problems. Further, the subjects appeared to structure their lives so that social circumstances reinforced their new behavior patterns.

Tuchfeld argues, in comparing spontaneous remitters with treated alcoholics, that "the processes leading to problem restitution are similar in form but different in content" (Tuchfeld 1981, p. 639). The treatment process relies on institutional controls, while the "supports observed in the present study were grounded in informal social controls" (p. 639).

Focusing on a different aspect of spontaneous recovery, Ludwig (1985) undertook to study the cognitive processes associated with SR. Twenty-nine spontaneous remitters were selected for testing and interviewing. (The subjects were divided between two groups: teetotalers and "relative abstainers," i.e., those who still drank occasionally but who had "virtually attained abstinence." In one typical example of the latter, the subject had taken one drink on each of three separate occasions over a 2.5 year period.) MAST scores were reconstructed from the transcribed interviews; the average scores were 25.3 for teetotalers and 22.8 for the relative abstainers. Teetotalers averaged 7.1 years of recovery and relative abstainers 3.3 years.

In this study, the subjective experience of "hitting bottom," regardless of what circumstances produced the experience, was often crucial: "Results indicate that 75% of respondents were in dire straits emotionally or physically prior to the radical change in their drinking patterns" (Ludwig 1985, p. 56). Profound experiences of the opposite kind—i.e., religious or transcendental experiences—also set recovery in motion for a significant number of respondents. (Ludwig notes that these events share an important characteristic: They "dramatically capture" the subjects' attention.)

A few subjects in this study developed a physical aversion to alcohol that prevented them from drinking, even though they wished they could. Another small group appeared simply to make an "existential decision" to quit drinking, based on a reasoned assessment of the pros and cons of continued alcohol use. But regardless of those differences, most of the subjects "arrived at a common cognitive destination: mental associations to alcohol with very unpleasant, sickening, humiliating or distasteful experience of a personal nature" (p. 57).

Perhaps the most striking aspect of the studies described above is that spontaneous remitters appear to be more like than unlike alcohol abusers and alcoholics who succeed in treatment. Tuchfeld (1981) suggests that important differences between the two groups are the former's reluctance to accept the designation of alcoholic and its members' related resistance to institutional forms of intervention. But, in other respects—particularly the critical need for a radical change in perception about one's drinking and the importance of social support for the maintenance of change—the similarities appear to outweigh the differences. Further research concerning both the incidence and the character of spontaneous remission may serve to define the two recovery processes more clearly and to reveal ways that the resolution of alcohol-related problems can be promoted more effectively. ■

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Measuring Body/Behavioral Experiences

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Fitness and Recovery

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THE FRANCISCAN PROGRAM

A fitness-and-recovery program used at the St. Francis Medical Center at Cape Giradeau, MO, provides a holistic model for use in alcoholism treatment. Known as the Franciscan Program, it incorporates both education about wellness and an exercise component within the treatment-and-recovery process. In this program, the patient first receives information on exercise and fitness in motivational lectures that emphasize such topics as the spiritual aspect of exercise and physical fitness as a technique for attaining a sense of purpose and happiness.

The patients learn a wellness-centered definition of physical fitness that includes the effects of exercise on the whole person—the physical, emotional, mental, and spiritual selves. Benefits of exercise that are emphasized include physically looking and feeling healthier, improving stress management, increasing self-esteem, and positively reinforcing the spiritual component of the individual.

Patients receive assistance in consideration of such things as choosing the exercises (whether to strive for flexibility, stress management, or cardiovascular endurance), building fitness into the patients' lifestyles, and setting personal goals (such as abstinence maintenance, smoking cessation, and weight loss). Prior to starting the exercise program, they also receive information about safeguards. A medical examination is always recommended. In addition, patients who are on medication are informed about the effects of some types of medication on heart rate, the recommended amount of warmup and cooldown exercises, and the importance of monitoring heart rate.

The patients next learn how to monitor their heart rates and to calculate their target heart rates (the pulse range to be maintained during vigorous exercise) based on their ages, sex, and resting heart rates (a good indicator of level of fitness). Patients are instructed to determine the resting heart rate just prior to getting out of bed in the morning, to count the working heart rate during vigorous exercise, and to check the recovery heart rate 5 to 10 minutes after the completion of vigorous activity.

During educational sessions, participants also learn the importance of doing a series of warmup and cooldown exercises to help reduce muscle soreness and to promote increased circulation and oxygen flow. Finally, each patient develops a 2-week behavior contract that details the positive behaviors and amounts and kinds of exercise that are to be perfomed.

An assessment made 2 weeks after start of the exercise program determines whether the patient has adhered to the contracted behavior. Results suggest that the majority of patients do fulfill contract obligations or do make significant progress toward their personal contract goals.

The Franciscan Program and the current research on physical fitness as a component of alcoholism treatment confirm the potential of the holistic approach as an aid in the recovery process. These efforts may be important stepping stones toward future progress in this field. ■

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Nutrition and Recovery

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In addition, intake of folic acid and of water-soluble substances that together form the vitamin B complex can help counter ethanol-induced impairment of deoxyribonucleic acid (DNA) synthesis in the liver and bone marrow—a condition which, if untreated, can lead to anemia and other complications (Leevy and Baker 1968).

In her article beginning on page 52 in this issue, Dorothy T. Moore discusses the reversible effects of alcoholism, many of *which are related to nutritional* deficits and so can be ameliorated by nutrition therapy. For instance, in the case of Wernicke's encephalopathy, an alcoholic psychosis characterized by cognitive impairment, the administration of large amounts of vitamin B_1 (thiamine) has sometimes produced remarkable recovery (Greenberg and Diamond 1985).

THE BODY'S STORAGE AND UTILIZATION OF VITAMINS

All cells, to some extent, store vitamins; but the liver is the major storage depot for many vitamins. Although only small amounts of vitamin K and water-soluble vitamins such as those in the B complex are stored, enough vitamin A can be stored in the liver of healthy nonalcoholic individuals to maintain a person without any intake of vitamin A for up to 10 months. Also, the quantity of vitamin D stored in the normal liver is sufficient to sustain a person for 2 to 4 months without any additional intake of the vitamin; for vitamin B_{12}, the storage life is more than a year (Guyton 1981).

In alcoholics, however, the ability to store vitamins is often impaired. Studies show that alcoholics with liver disease exhibit reduced hepatic uptake and storage of and avidity for most vitamins (Leevy and Baker 1968). In addition, conversion of free vitamins into metabolically active forms is often impaired in the alcoholic with liver injury. Under these circumstances, the individual may also show symptoms of a vitamin deficiency state, although vitamin levels appear normal. This condition underscores the importance of careful medical assessment of the nutritional needs of the recovering alcoholic. ■

—DOUG M. PODOLSKY

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EPRA

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sessions to share job-related experiences, problems, and successes with other graduates and EPRA staff members. Suggestions are offered on how to handle problems as they arise and how to pursue opportunities for advancement. Also, EPRA's alumni association sponsors a newsletter, seminars, fundraising, and social activities to share continued growth and career development.

For further information, contact Richard P. Masterson, EPRA, 360 West 31st Street, New York, NY 10001. ■

—LAURA RONAN

Aftercare Programs for Women

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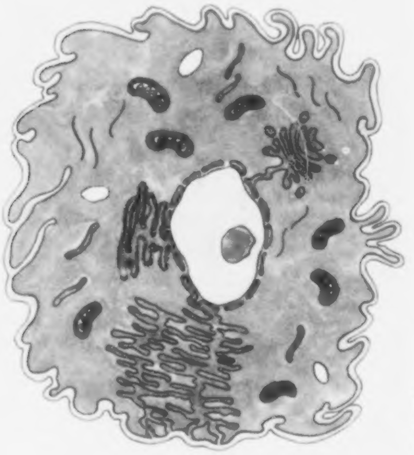
DEPARTMENTS

Research Reports

Note to Readers: *In News Notes, The Occupational Arena, Research Reports, and Safety Update, we seek to provide a place for the exchange of useful information from all over the country and from all interested professionals, organizations, lay groups, and volunteers. **We** encourage our readers to submit items of value for publication in upcoming issues of* Alcohol Health and Research World. *Send all materials to The Editor,* AH&RW, *P.O. Box 2345, Rockville, MD 20852.*



Kim Mulholland

Alcohol and the Cell

The cell, the common building block of organic life, is normally too small to be discerned with the naked eye; but it provides a rich and expansive territory for scientists exploring the causes and effects of alcohol use and abuse. Such basic research on the biologically perturbing effects of alcohol is an excellent way to gain "insights into normal metabolism, function, and structure" Emanuel Rubin, M.D., proposed in opening the "Alcohol and the Cell" symposium of the New York Academy of Sciences this past spring in Philadelphia.

NIAAA provided the initiative and major support for this conference, which was designated as one of its Alcohol Research Utilization System (ARUS) series. A principal purpose for ARUS is to foster productive communication and interaction among researchers and practitioners in the alcohol field.

Appropriately enough, alcohol shared top billing with cells of liver, intestines, brain, blood, peripheral nerves, muscles, adrenal glands, placenta, and testes in the 30 papers and 34 posters prepared for this 3-day, state-of-the-art meeting of scientists from the United States and abroad.

The six sessions of the symposium were organized under the following headings:

I Alcohol and acetaldehyde metabolism
II Effects of ethanol on biological membranes: physical studies
III Effects of ethanol on biological membranes: chemical studies
IV Effects of ethanol on transport and protein synthesis
V Effects of ethanol on cell organization and function
VI Effects of ethanol on cells of the nervous system

The full proceedings will be published as a volume of *Annals of the New York Academy of Sciences.* NIAAA will also publish a summary and other materials based on the conference. For information on this and other ARUS programs, contact James Snapp, Division of Prevention and Research Dissemination, NIAAA, 5600 Fishers Lane, Rockville, MD 20857.

—Dorothy T. Moore

California's Social Model of Recovery from Alcoholism: Report on a Conference

Recently, the Program on Alcohol Issues of the University of California, San Diego, sponsored a 3-day conference, "California's Social Model of Recovery from Alcoholism," intended to explore social-model issues in terms of current research, theory and practice, and public policy. For the purposes of the conference, social-model programs were defined as those based on principles of mutual aid and self-help and characterized by a sober and supportive peer environment, reliance on the experiential knowledge base of other recovering alcoholics, and emphasis on personal responsibility and lifelong abstinence. Such programs generally do without the services of medical practitioners, therapists, case managers, and other professional staff.

The conference featured presentations by both practitioners and researchers. Among the subjects discussed by practitioners were the beginnings of social-model programming, the historical evolution of social-model principles, and evidence suggesting that social-model programs can deliver services as effective as those of standard clinical programs but at a lower cost.

Research-based presentations included a discussion by Connie Weisner, M.S.W., (Alcohol Research Group, Berkeley, CA) who surveyed historical trends that have influenced the development of social-model thinking. Weisner asserted that broad acceptance of this model has been hindered in the past 30 to 40 years by three factors: (1) a decrease in public funding of alcohol services; (2) the rise of third-party reimbursement for medically oriented treatment models; and (3) the consequent shift among occupational alcohol programs towards professionally sanctioned models.

The loss of industry support, Weisner argued, has historically forced social-model programs to turn to the criminal justice diversion system for paying clients. This trend has created role conflicts and substantial internal stresses for social-model programs, including erosion of the peer or mutual-aid dynamic, absorption of staff time in bureaucratic and legalistic accountability functions, and the elevation of coercion to an ideology that positively sanctions intervention. Weisner cited the need for outcome research comparing the medical model with the social model.

Marc Schuckit, M.D., (Veterans' Administration Medical Center and University of California at San Diego) compared standard medical treatment of alcohol withdrawal with social-setting detoxification. His literature review suggests that the latter is best suited only for those clients who are able to withdraw from alcohol with mild to moderate symptomatology. Following a thorough medical examination, further medically supervised withdrawal may not be cost effective for many alcoholics, according to Schuckit. He warned, however, that social-setting detoxification programs should (1) maintain adequate screening procedures and medical backup, (2) avoid detoxification of polydrug abusers, (3) provide routine physical examinations, and (4) offer thiamine and other vitamin supplements for all clients.

Friedner Wittman, Ph.D., (Prevention Research Center, Berkeley, CA) used slides to illustrate important architectural elements in the design of social-model facilities. Wittman argued that because a common feature of alcoholism is a feeling of worthlessness, it is vital for physical settings to enhance participant self-esteem. Furnishings of average or better quality and taste are necessary, he noted, and even modestly funded programs can ensure that facilities are clean and well-kept. Wittman's slides also illustrated how facility design can work to promote interpersonal interaction among participants and to enhance communication between paid staff and participants.

Citing the conclusions of a recent study of alcohol programs in California, Thomasina Borkman, Ph.D., (George Mason University, Fairfax, VA) offered some comparisons between social and medical approaches to recovery. She prefaced her remarks with an analogy: "The social model is to the medical model as learning Zen philosophy through archery is to studying Ph.D.-level philosophy in a university." The social model, argued Borkman, is a way of life that involves total immersion of the individual—physically, mentally, and spiritually—in the learning experience. In contrast, she continued, the medical model is a body of theoretial and applied knowledge that can be acquired through rigorous study but which exists apart from the fundamental personality core of the individual practitioner. The social model is inherently difficult to research, being by nature holistic and experiential.

Medical programs, said Borkman, use peer-group interaction as one of several approaches to breaking down denial and modeling healthy behavior. In contrast, the social model values peer involvement as the principal vehicle for transmitting recovery information between participants. Peer interaction creates the self-correction feedback loop that allows participants to experiment with Alcoholics Anonymous (AA) and social-model principles in daily life, she said.

During the final panel and conference summation, E. Ripley Forbes (professional staffperson to the Subcommittee on Health and the Environment of the U.S. House of Representatives) commented that a major decision facing social-model advocates is whether to pursue third-party reimbursement aggressively or to look for increased levels of support from State and Federal sources. Forbes warned that hospital treatment programs are setting the parameters of the national discussion on the design and the funding of alcohol treatment. However, because of the current congressional mood of austerity, social-model practitioners have an excellent opportunity to influence Washington policymakers. A consensus emerged among panel members that it is essential for social-model adherents to come together and "package" their ideas in a manner that will convince legislatures either to require insurance industry recognition or to expand governmental support of social-model programs.

In his closing comments, conference chairperson Dean Gerstein, Ph.D., (National Research Council, Washington, DC) identified "crucial" issues with regard to the national adoption of the social model as a major alternative to the medical model:

- Appropriate training
- Services to populations with psychiatric or medical problems and flexibility in responding to clients with multidimensional needs
- Problems associated with coerced clients
- Appropriate research and evaluation strategies
- Third-party reimbursement

The complete proceedings of the conference are available from the Program on Alcohol Issues, University of California–San Diego, University Extension, X-001, La Jolla, CA 92093.

—*John de Miranda, Ed.M.*

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News Notes

Thirty nine percent of hospital room episodes collected by DAWN were classified as suicides.

Alcohol and Suicide

Data collected by the Drug Abuse Warning Network (DAWN, operated by the National Institute on Drug Abuse) reinforce the belief that alcohol is often involved in suicide and suicide attempts.

DAWN collects reports on drug abuse-related cases from approximately 750 emergency rooms and 80 medical examiners' offices nationwide. Alcohol is reported to DAWN only when used in combination with other drugs. Although the DAWN system is not a population-based or representative sampling system, its statistics are a useful complement to other epidemiological data and provide useful information on trends.

In 1984, DAWN received reports of 3,486 drug abuse-related deaths, of which 1,167 (33

The most frequently used substances ingested during suicide attempts and suicides

Rank	Suicide Attempts	Suicides
1	Alcohol combined with other drugs	Alcohol combined with other drugs
2	Diazepam	Amitriptyline
3	Aspirin	d-Propoxyphene
4	Acetaminophen	Diazepam
5	Codeine combinations	Acetaminophen

(Source: *NIDA Statistical Series*, Annual Data 1984: Data from the Drug Abuse Warning Network, Series 1, No. 4, 1985) percent) were classified as suicides. Of 102,843 hospital emergency room episodes, 40,045 (39 percent) were classified as suicide attempts. Alcohol, in combination with other drugs, was the substance most commonly used in both suicides and suicide attempts (see table). Twenty-five percent of suicides and 19 percent of suicide attempts involved alcohol in combination with other drugs.

For more information, contact Ann Blanken, Division of Epidemiology and Statistical Analysis, National Institute on Drug Abuse, 5600 Fishers Lane, Room 11A-55, Rockville, MD 20857.

—*Thomas Prugh*

Stress and Child Abuse Booklet

The National Committee for Prevention of Child Abuse has published a booklet entitled "Making the World Safe for Jeffrey," which discusses the ways stress can make the already tough job of parenting seem unmanageable. In easy-to-read prose, the illustrated booklet explains stress in terms of the fight-or-flight response and reviews the topics of unrealistic expectations, taking responsibility, relaxation, and sources of help. "Making the World Safe for Jeffrey" was written by a child psychiatrist and a school guidance counselor.

A single copy costs $2 plus 50 cents for shipping and handling. Quantity prices and a catalog are also available. Order from the National Committee for Prevention of Child Abuse, Publishing Department, 332 South Michigan Avenue, Suite 950, Chicago, IL 60604-4357.

—*Thomas Prugh*

Costs of Alcohol Abuse Assessed in Minnesota

A report published by the Minnesota Department of Health serves to illustrate both the diversity and size of the economic toll exacted by alcohol abuse and alcoholism. "Review and Cost of Alcohol Abuse in Minnesota" details the losses associated with alcohol problems in that State in terms of death, injury, disability, and related costs during 1983. Among the highlights:

- Alcohol abuse was implicated in 1,100 deaths in 1983. Injuries and digestive diseases related to alcohol abuse accounted for 80 percent of the total.
- Direct health-care costs of alcohol problems—the costs of prevention, diagnosis, and treatment—totaled $211 million, or about 4 percent of all personal health-care spending in the State.
- The costs of lost productivity and income owing to premature alcohol-related deaths were estimated at $321 million.
- Long-term employment losses totaled $72 million.
- The losses due to reduced productivity—the largest single item—were estimated to run as high as $1.19 billion.

The report also breaks out the costs of vehicle fatalities, injuries, and collisions; liquor law and driving-while-intoxicated offenses; property damage from alcohol-related fires; child abuse; and fetal alcohol syndrome. Appendices discuss alcohol's contribution to cancer, pancreatitis, liver cirrhosis, suicide, and homicide.

The report concludes that the total cost of alcohol abuse in Minnesota during 1983 may have been as high as $1.95 billion, or upwards of 4 percent of all personal income. It cautions that some costs, such as unreported injuries and the toll in personal suffering, cannot be estimated with certainty.

For more information, contact Michael Moen, Director, Division of Disease Prevention and Health Promotion, Minnesota Department of Health, 717 Southeast Delaware Street, Minneapolis, MN 55440.

—*Thomas Prugh*

Inpatient Relapse Program

Father Martin's Ashley, a chemical addiction treatment program in Havre de Grace, MD, has announced a treatment service designed specifically for clients who have been in treatment before and have relapsed after a period of abstinence. The 28-day program is designed to examine the process, in each client, that led to relapse; to identify the reasons for relapse; and to discover ways to prevent future relapses.

Ashley's relapse program parallels its existing inpatient program for clients entering treatment for the first time. For further information, contact Micki Thomas, Father Martin's Ashley, 800 Tydings Lane, Havre de Grace, MD 21708.

—*Thomas Prugh*

Safety Update

Chemical Tests for Drugged Drivers

Research recently conducted under contract to the National Highway Traffic Safety Administration (NHTSA) suggests that blood testing remains the only technology sound enough to provide court-acceptable chemical tests of drug use in impaired drivers.

In the wake of passage in many States of DUID (driving under the influence of drugs) laws, a need has arisen for chemical tests that police can use at the roadside or in the stationhouse to determine impairment. Since breath testing does not appear to be a useful means of assaying for drugs other than alcohol, the NHTSA project focused instead on means of analyzing urine or saliva for the presence of drugs.

Existing pharmacological laboratory data were reviewed and/or re-analyzed in order to determine the relationship of drug concentrations in urine and saliva to blood concentrations and, subsequently, to performance. Drugs studied included marijuana, secobarbital, diazepam, diphenhydramine (an antihistamine), and methaqualone (a nonbarbiturate sedative/hypnotic).

The results suggest that marijuana is best detected by urine testing. Saliva testing works best for the other drugs. In each case, threshold concentrations were determined that correlate to some extent with potentially impairment-causing blood levels. The precise blood levels associated with impaired driving remain to be specified, however.

The report cautions that positive results on urine and saliva screening tests cannot be taken as proof of impairment and should be used only as indicators of the need for corroborative blood testing.

This research is described more fully in a summary technical report entitled "Feasibility Assessment of Chemical Testing for Drug-Impaired Driving." The complete report is available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (order DOT-HS-806-888).

For further information, contact James F. Frank, National Highway Traffic Safety Administration, Office of Driver & Pedestrian Research, 400 Seventh Street, SW, Washington, DC 20590.

—*Thomas Prugh*

Occupational Arena

In-Vehicle Alcohol Test Devices

The National Highway Traffic Safety Administration (NHTSA) recently evaluated two prototype alcohol breath-test devices designed to be interlinked with automobile ignition systems in order to prevent impaired drivers from operating vehicles so equipped. A laboratory study was undertaken to determine how well the devices could discriminate different breath concentrations of alcohol, how vulnerable they were to deception, and whether certain special features worked as intended.

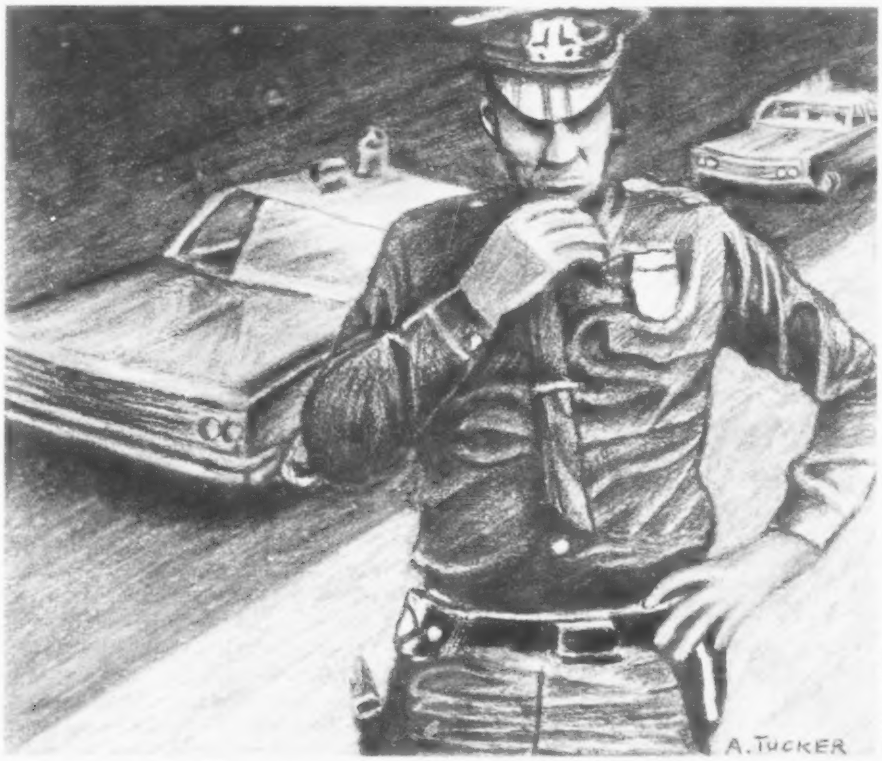
The first prototype consistently detected alcohol samples above .020 percent blood alcohol concentration (BAC), better than its claimed threshold of .025 percent BAC. However, a special feature designed to ensure that all samples were between 89 degrees and 98 degrees Fahrenheit did not perform as claimed. Furthermore, bogus samples from hairdryers, balloons, and plastic bags could all be made to fool the device provided the temperature sensor was satisfied. The researchers also found that alcohol-rich samples could be purged well enough to fool the prototype by passing them through materials like cat litter and commercially available glass breath-test tubes.

The second device was claimed to discriminate BACs of .10 percent or above. The detection threshold in the tested prototype was actually .05 percent. A special pressure sensor intended to require a forceful breath could be fooled by specially adapted equipment.

The researchers note that this study tested only prototypes and that it is inappropriate to generalize the results to other existing devices or to any that might be developed in the future. The study is described more fully in a report entitled "Laboratory Testing of Two Prototype In-Vehicle Breath Test Devices," available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (order DOT-HS-806-821).

For additional information, contact James F. Frank, National Highway Traffic Safety Administration, Office of Driver & Pedestrian Research, 400 Seventh Street, SW., Washington, DC 20590.

—*Thomas Prugh*



Alexander Tucker

A need has arisen for chemical tests that police can use at the roadside to determine impairment.

Alexander Tucker

Self-help groups allow professionals to seek support without risking career status.

Professional Self-Help Groups

In recent years, concern has been rising in the professions about problems of impairment from alcohol and other drug abuse among their members. In response, self-help groups have sprung up in a number of professions. These groups vary in their structures, stated purposes, and philosophies; but most share certain features, including the belief in the usefulness of peer support in achieving and sustaining a life free of chemical abuse. Such groups allow professionals to seek help without risking professional status. They also permit professionals—who are often expected to be "above" such problems because of their callings as physicians, psychologists, or clergy, for example—to observe colleagues coming to terms with their impairments, and the associated guilt and stigma, and subsequently building new lives for themselves.

Listed below are the names and addresses of several self-help organizations for particular professions. The National Clearinghouse for Alcohol Information (NCALI) has also compiled a more extensive directory of self-help organizations for the professions, groups for other special constituencies, and related resource organizations. Copies may be obtained by writing the National Clearinghouse for Alcohol Information, P.O. Box 2345, Rockville, MD 20852, or by calling NCALI at (301) 468-2600 (order MS330). Readers are urged to submit information on self-help groups for incorporation into updated editions of the directory. Please send all submissions to the address above, attn: Resource Materials Coordinator.

Anesthetists in Recovery
5626 Preston Oaks Rd., Unit 40-D
Dallas, TX 75240
(214) 960-7296
attn: Beth Visitine, CRNA

Dentists Concerned for Dentists
Diane M. Milan, Administrative Secretary
The Bigelow Building, Suite 117
450 North Syndicate St.
St. Paul, MN 55104
(612) 641-0730

International Doctors in Alcoholics Anonymous
1950 Volney Rd.
Youngstown, OH 44511
(216) 782-6216
attn: L. K. Reed, M.D.

Lawyers Concerned for Lawyers
Diane M. Milan, Administrative Secretary
The Bigelow Building, Suite 117
450 North Syndicate St.
St. Paul, MN 55104
(612) 646-5590

Psychologists Helping Psychologists
23439 Michigan Ave.
Dearborn, MI 48124
(313) 565-3821
attn: Jane K. Skorina, Ph.D.

Recovered Alcoholic Clergy Association (Episcopal)
647 Dundee Ave.
Barrington, IL 60010
(312) 381-2323
attn: Rev. W. D. McLean III

Conference on Drug Abuse in the Workplace

At a recent conference arranged by the National Institute on Drug Abuse (NIDA), representatives of more than 125 business, labor, academic, and public interest organizations gathered in an effort to achieve some agreement on fair and judicious policies concerning workplace chemical abuse. Conference participants agreed on three major points to be included in a general consensus statement:

1. *Drug abuse is a significant public health problem; it is pervasive in our society.*

   Supporting statements note that the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) estimates the annual productivity losses attributable to alcohol and drug abuse at nearly $100 billion.

2. *Drug abuse is a problem which must be addressed clearly and decisively in a fair and equitable manner with due consideration of the rights of the employer, employee, and the general public.*

   The consensus statement advocates obtaining input concerning workplace chemical abuse programs from all relevant parties, including labor relations and union representatives as well as staff from the legal, medical, security, and employee assistance departments. Policies concerning alcohol and other drug abuse should be clear, openly published, and consistently adhered to.

3. *Drug abuse policy should be developed according to the best available current knowledge about the characteristics of drug abuse.*

Kurt Mulholland

The report recommends that expert advice be obtained concerning the technical aspects of any proposed program and that the employer become involved in the identification, treatment, and followup of impaired employees. "Urine screening," the report notes, "can be an effective tool in the early identification of employees with drug problems." However, "extreme caution must be encouraged to assure that the collection, handling, and testing procedures are reliable and accurate."

Additional consensus statements are under development in the specific areas of legal and security issues, health and safety, and human relations. For further information, contact Lucy Walker, Press Office, National Institute on Drug Abuse, 5600 Fishers Lane, Rockville, MD 20857.

Reversal of Alcohol Effects

(continued from page 59)

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Caffeine Use

(continued from page 64)

as well as free coffee for 3 months. The findings showed that the pretreatment and current use levels of juice consumption did not differ significantly from each other. The previous finding of more coffee being consumed during treatment rather than prior to treatment was replicated. In the second study, two other psychiatric outpatient day programs that also provided free coffee were surveyed. These groups did not show any change in their coffee consumption patterns entering treatment, and they consumed less coffee than the alcoholics while in treatment.

Correlations were run between the mood scale scores (the Zung depression scale, the State-Trait anxiety measure, and the distress self-rating) and the amount of coffee consumed at present. There were no significant relationships between the amount of coffee consumed and the mood scales.

DISCUSSION

Our sample of patients confirmed reports based on anecdotal information that recovering alcoholics—at least those who attend treatment centers and Alcoholics Anonymous (AA) meetings—drink more coffee than they drank when they were drinking alcohol. This increase in coffee use begins within the first month of alcohol use cessation and continues throughout treatment. There is no increase in the intake of any other caffeine-containing substance.

The findings of Gilliland and Bullock (1984*a*, 1984*b*) do not seem to apply to our sample: Recovering alcoholics who drank a great deal of coffee (ranging up to 20 cups a day) did not report more anxiety and depression than their counterparts who drank less. There was no observable relationship between the affective symptoms of PAWS and coffee usage. It is unclear why our study was unable to replicate the findings with normal subjects. ■

J. Scott Verinis, Ph.D., is currently directing outpatient aftercare in the West Side VA Alcoholism Treatment Program, West Side Medical Center, P.O. Box 8195, Chicago, IL 60680.

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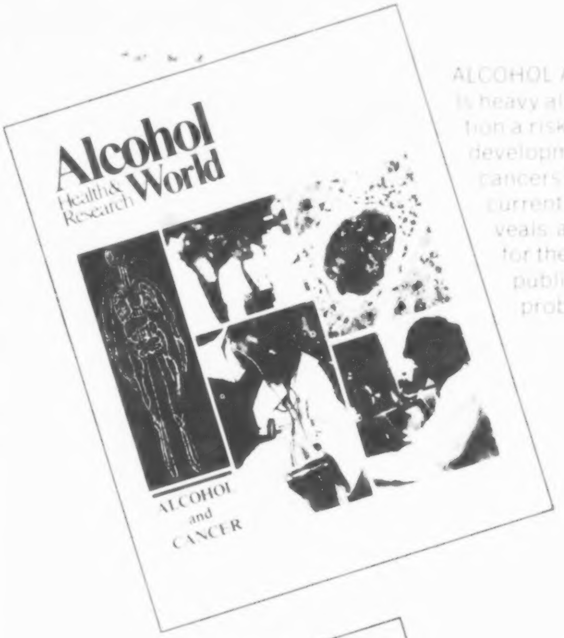

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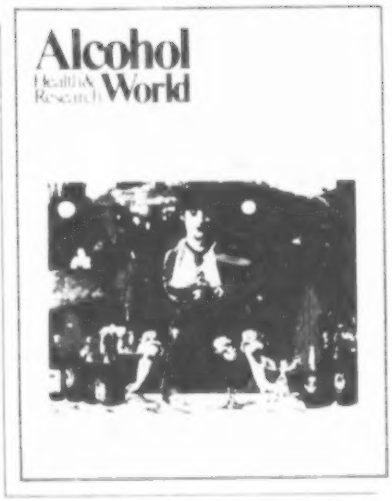

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